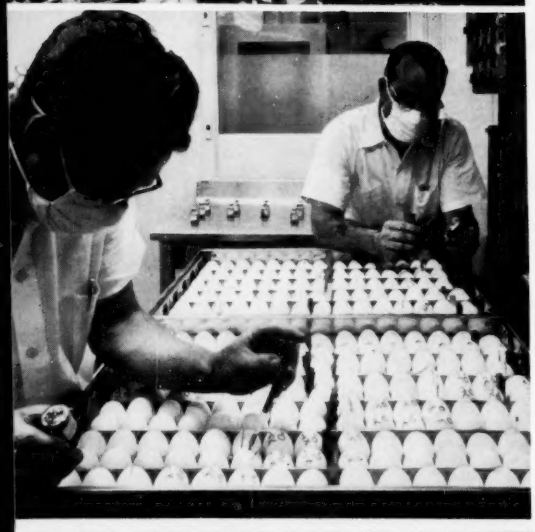
Chemical Week

August 18, 1956

Price 35 cents



Dow's going into synthetic fibers on its own, will make Zefran, a new acrylic staple . . . . . p. 29

Minnesota's Twin Cities—their chemical future hinges on new mining in three states . . . . p. 39

Titanium experts are cool to the tetra-iodide process. But they could be wrong—here's why . p. 58

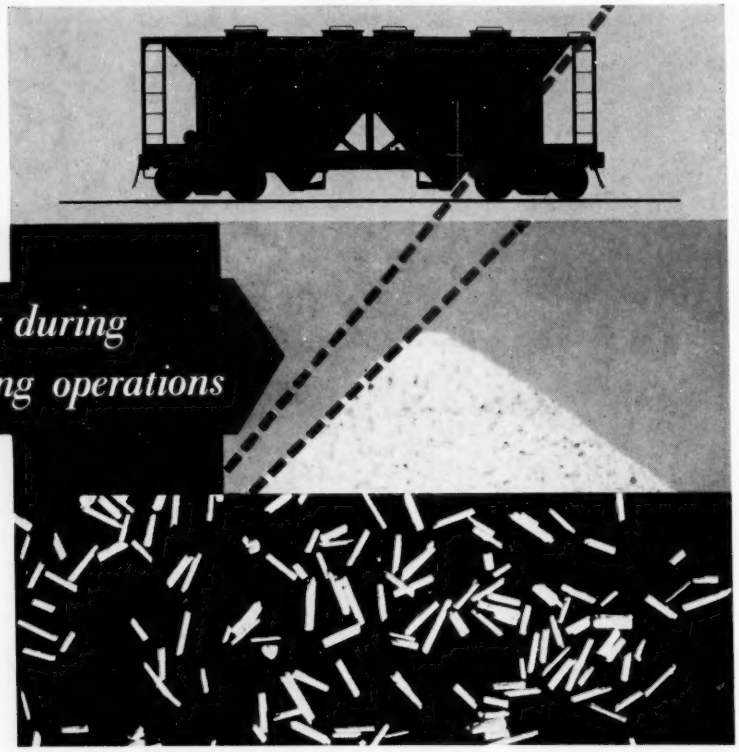
Virus probers are making headway in the new push for broad-spectrum drugs . . . . . p. 80

Biggest in the West and growing fast: that's Van Waters & Rogers chemical distributing setup . p. 92

A McGRAW-HILL PUBLICATION

Westvaco®

SODA ASH... *better because*



it flows so freely during unloading and handling operations

WESTVACO Soda Ash flows into a conical pile with its sides far flatter than the sloping bottom of a hopper car.

The exceptional flowability of WESTVACO Soda Ash is the result of its unique, needle-like structure, illustrated in the bottom panel above. Rod-shaped crystals flow as millions of tiny rollers, make handling easier. They don't cake during storage.

WESTVACO Soda Ash, chemically pure, ammonia free, low in iron and insolubles, dusts less and dissolves quickly. Users of soda ash from the Mississippi Valley to the Panhandle to the Pacific should use WESTVACO Soda Ash. Let us quote on your needs.

Westvaco® CHEMICALS

Westvaco Chlor-Alkali Division
FOOD MACHINERY AND CHEMICAL CORPORATION
161 E. 42nd St., New York 17 · Chicago St. Louis Denver Philadelphia So. Charleston, W. Va.

fmc FOOD MACHINERY AND CHEMICAL CORPORATION

FMC CHEMICALS INCLUDE: BECCO *Peroxygen Chemicals* • WESTVACO *Alkalis, Chlorinated Chemicals and Carbon Bisulfide* • NIAGARA *Insecticides, Fungicides and Industrial Sulphur* • OHIO-APEX *Plasticizers and Chemicals* FAIRFIELD *Pesticide Compounds and Organic Chemicals* • WESTVACO *Phosphates, Barium and Magnesium Chemicals*

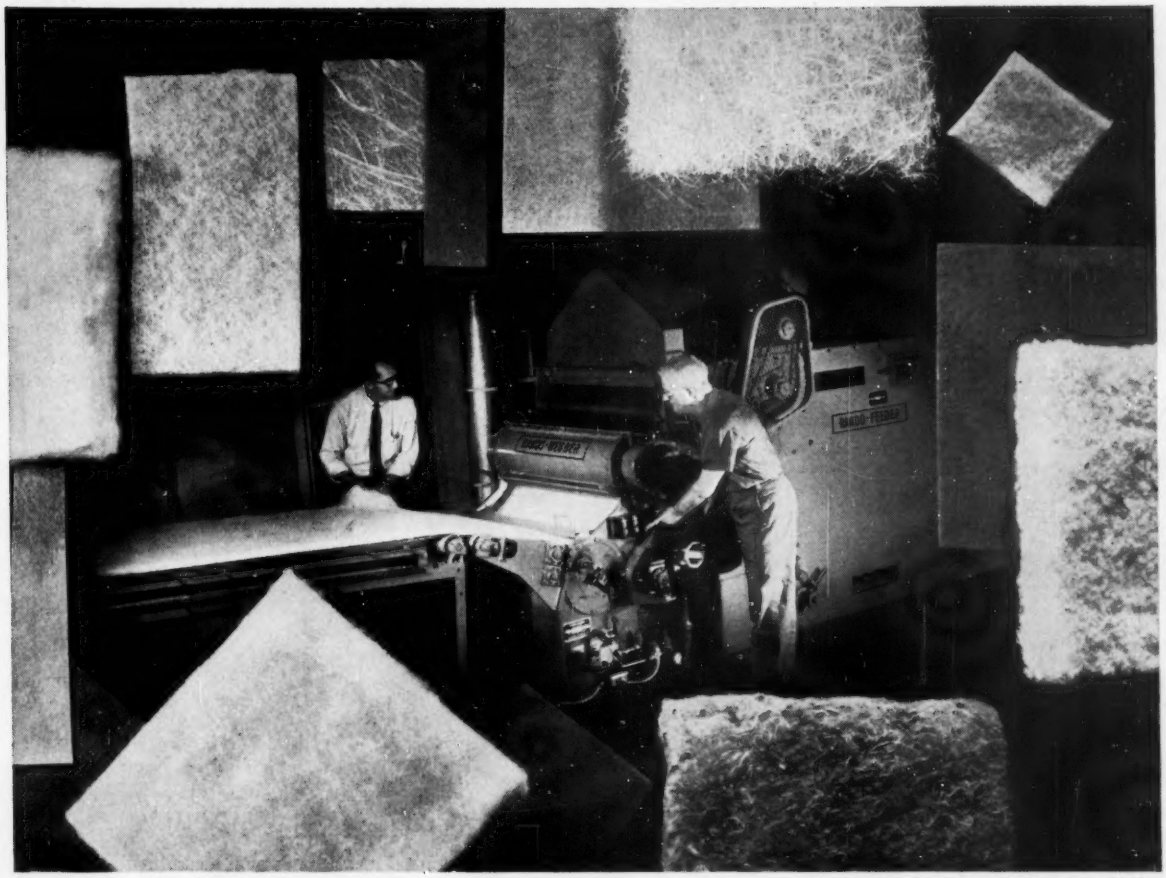


Photo courtesy Curlator Corporation, East Rochester, N. Y.

Waste not, want not — 1956 style!

Pictured above is one way for today's manufacturers not to be found wanting for a method of turning processing wastes into profitable products. These ingenious machines convert a variety of fibers—animal, vegetable, mineral or synthetic—into versatile, nonwoven fabrics, mats, wadding or felt, efficiently and economically.

Take cord or yarn wastes. By feeding them through a "webber" and impregnating them with a bonding agent based on CHEMIGUM LATEX, one soon has a strong, smooth, soft, porous, random fiber fabric.

CHEMIGUM LATEX is a colloidal dispersion of a butadiene-acrylonitrile copolymer. It is used in bonding agents to impart permanent adhesion, flexibility and softness.

Moreover, CHEMIGUM LATEX is easily handled and compounded. No complicated equipment or processing problems are involved in giving you an unusual product of wide application.

Write today for details and the latest *Tech Book Bulletins* on CHEMIGUM LATEX in nonwoven fabric and many other uses. Address: Goodyear, Chemical Division, Dept. T-9417, Akron 16, Ohio.

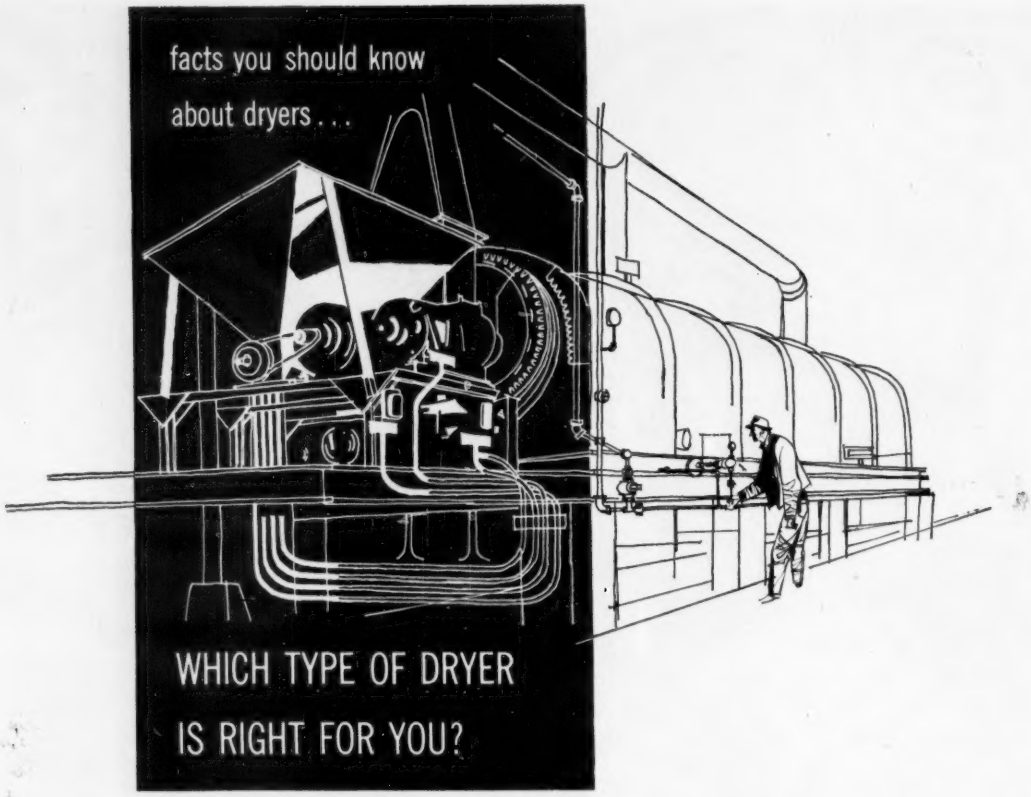
CHEMICAL
GOODYEAR
DIVISION

COATINGS
DEPARTMENT

Chemigum, Plioflex, Pliolite, Plio-Tuf, Pliovic—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

CHEMIGUM • PLIOFLEX • PLIOLITE • PLIO-TUF • PLIOVIC • WING-CHEMICALS

High Polymer Resins, Rubbers, Latices and Related Chemicals for the Process Industries



For over 55 years, Louisville Dryers have been solving industry's drying problems and effecting marked economies. The following is intended as an introduction to selecting the right type of dryer.

Q. *What types of dryers are there?*

A. Many types. They can be classified in two basic categories, namely, batch type and continuous.

Q. *What is proper application of the continuous type?*

A. Where large enough capacity is required to make savings in labor, space, and fuel advantageous.

Q. *What are some other advantages of the continuous type?*

A. Uniform quality of dried product. Lower drying cost.

Q. *What types of continuous dryers are most used?*

A. Rotary, Conveyor, Flash, Spray, Atmospheric Drum.*

Q. *Do all of the above types handle the same kind of material?*

A. No. While they discharge a dried solid, Spray and Drum Dryers are fed with a liquid. (Liquids and thin slurries can be handled in the other types by means of special designs or auxiliary equipment, but seldom are).

Q. *How can I be sure of getting the right type of dryer for my operation?*

A. Louisville engineers start by surveying your needs. Then, after considering the pertinent factors, they make recommendations for dryer type, heating medium, etc. Their recommendations can be proved by practical drying tests in General American's pilot plant. Your Louisville Dryer is then designed and built to suit your particular purpose and to fit your individual needs.

Q. *How can I investigate the matter in greater detail?*

A. Call in a Louisville engineer. No cost or obligation.

*Discussions to follow will deal with the subject in more detail.

PROCESS EQUIPMENT DIVISION
GENERAL AMERICAN
TRADE MARK

LOUISVILLE DRYING MACHINERY UNIT

GENERAL AMERICAN TRANSPORTATION CORPORATION

Dryer General Sales Office: 139 So. Fourth Street, Louisville 2, Kentucky
Eastern Sales Office: 380 Madison Avenue, New York 17, New York
In Canada: Canadian Locomotive Company, Ltd., Kingston, Ontario, Canada
General Offices: 135 S. La Salle Street, Chicago 90, Illinois

Chemical Week

TOP OF THE WEEK **August 18, 1956**

Here's what the boost in steel prices will mean to the expansion plans of equipment-hungry chemical companies .....p. 30

Firms operating in Britain and Canada have new government actions to contend with—attempts to maintain present price levels in Britain, greater domestic ownership in Canadian subsidiaries .....p. 31

Hard-to-tap paint market: heat-reflecting coatings for industry and home .....p. 48

Final three Tariff Commission reports (plastics, medicinals, miscellaneous) underline synthetic organic chemicals' spree in '55 .....p. 72

17 BUSINESS NEWSLETTER

22 OPINION

26 UPCOMING MEETINGS

29 BUSINESS NEWS
Dow's Zefran—a new synthetic staple fiber—is going commercial

31 The Swiss government has asked arbitration of the Interhandel claim to GAF stock which was dismissed by the U. S. courts

33 WASHINGTON ANGLES

35 CHARTING BUSINESS

39 ADMINISTRATION
At Minneapolis and St. Paul, chemical firms move in on new processing opportunities

42 Preview on industrial relations for '57: conventions of chemical unions

48 SPECIALTIES

49 'New' paints from old—paint-reclaiming techniques gives one firm a second chance at profits

54 There's more sugar in the cane when chemicals are used to reduce tasseling

58 PRODUCTION
Thermal dissociation of titanium tetra-iodide bids to become main link in the newest commercial titanium process

62 Oil looks to the atom as a means to unlock petroleum products

69 TECHNOLOGY NEWSLETTER

72 MARKETS

76 Rough sledding ahead for South American tannin producers, but the fight is on to save waning markets

80 RESEARCH
New, lab-screened broad-spectrum antivirals spearhead hunt for compounds to thwart virus diseases

84 U.S. Public Health Service weighs research on coal mine acid waste control

89 MARKET NEWSLETTER

92 SALES
Rapid growth marks rise of Van Waters & Rogers to largest West Coast chemical distributor

98 Confusion in the West: truckers tangle for lucrative chemical business

102 Freight car demurrage is going up

Vol. 79
No. 7

Chemical Week (including Chemical Specialties and Chemical Industries) is published weekly by McGraw-Hill Publishing Co., Inc., 330 W. 42nd St., New York 36, N.Y. Printed in U.S.A. Second-class mail privileges authorized at Philadelphia, Pa. Copyright 1956 by McGraw-Hill Publishing Co., Inc. All rights reserved. Subscription: $3.00/year in U.S.A., U.S. Possessions and Canada; $15.00 in other Western Hemisphere countries; $25.00 in all other countries.

SNELL MEANS PRODUCTIVE RESEARCH

Foster D. Snell, Inc. is a Technical Research Organization available to survey your problems through Research, Development and Testing.

We SURVEY your problems
EVALUATE your materials
RECOMMEND procedures
FORESEE the result.

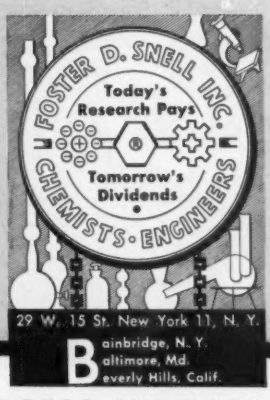
Such enables you to meet and master competition — to make more money. It embraces the perfection of present products and the development of totally new ones.

An independent, unbiased Consulting Organization is totally uninhibited; determines whether it can be done and how.

We have scientific manpower, vast equipment and know-how. All our cumulative experience is brought to bear on your problem. Thus when given your problem we are not "outsiders" but part and parcel of your own organization.

We do not simultaneously handle competing problems. You are, in confidence, assured of concentration of our talents. We function as your Research Division, or complement your own facilities, immediately relieving manpower overload and delay.

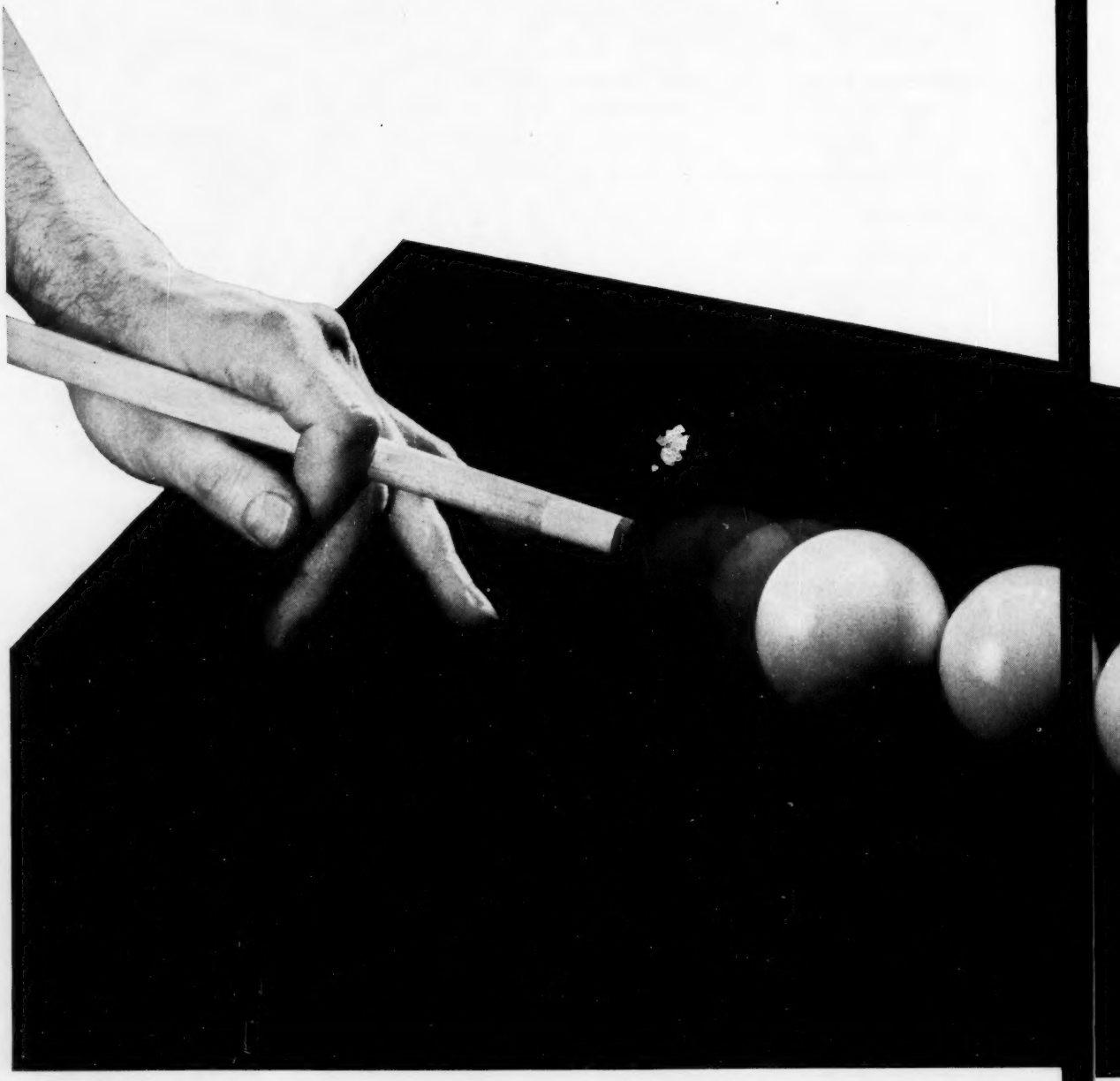
Without obligation, you are cordially invited to inquire as to our ability to serve you.



29 W. 15 St. New York 11, N. Y.
Bainbridge, N. Y.
Baltimore, Md.
Beverly Hills, Calif.

Creative Chemical

A "chain reaction" fills customers' needs



Marketing *in action . . .*

Behind the eightball due to an outage of an ammonia plant at Marcus Hook, Pa., Olin Mathieson again brought into play its unique flexibility to relieve an emergency that threatened the operation of scores of important industries in that area.

The key to the problem was Olin Mathieson's fertilizer plant at far-off Pasadena, Texas. Production there was immediately shifted from a high-nitrogen fertilizer to a grade requiring considerably less ammonia. The ammonia—thus "saved"—which was normally supplied from the Lake Charles Plant, was shifted to consumers in the Midwest formerly served by the plant at Morgantown, W. Va. Ammonia from that point could then be shipped into the area menaced by the sudden shortage.

See how Creative Chemical Marketing can help you

Multi-plant facilities, diversified end-use pattern and strategic plant locations—combined with an imaginative approach to the logistics of the chemical industry—produce results. Olin Mathieson customers accordingly benefit in day-to-day operations as well as in emergencies.

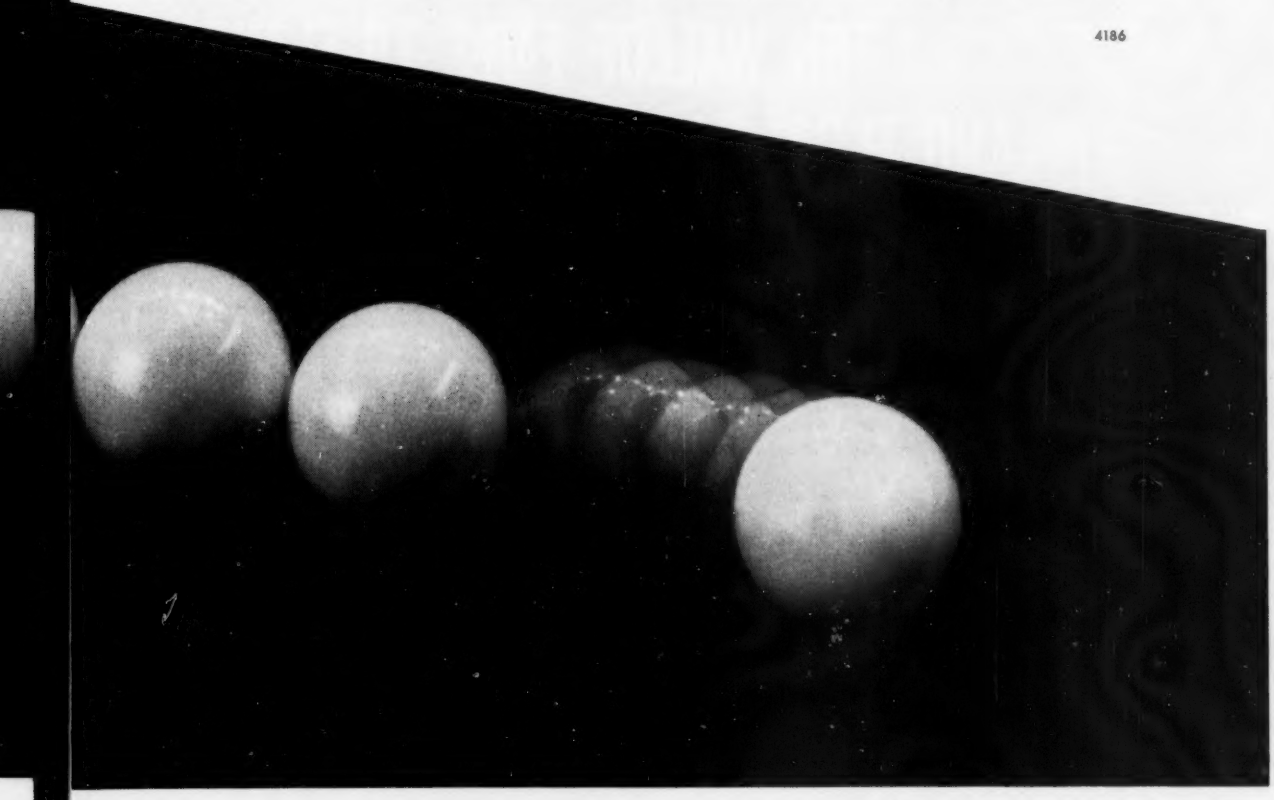
If you buy caustic soda, sulphuric acid, ammonia, soda ash or chlorine, Olin Mathieson's creative marketing can work for you.

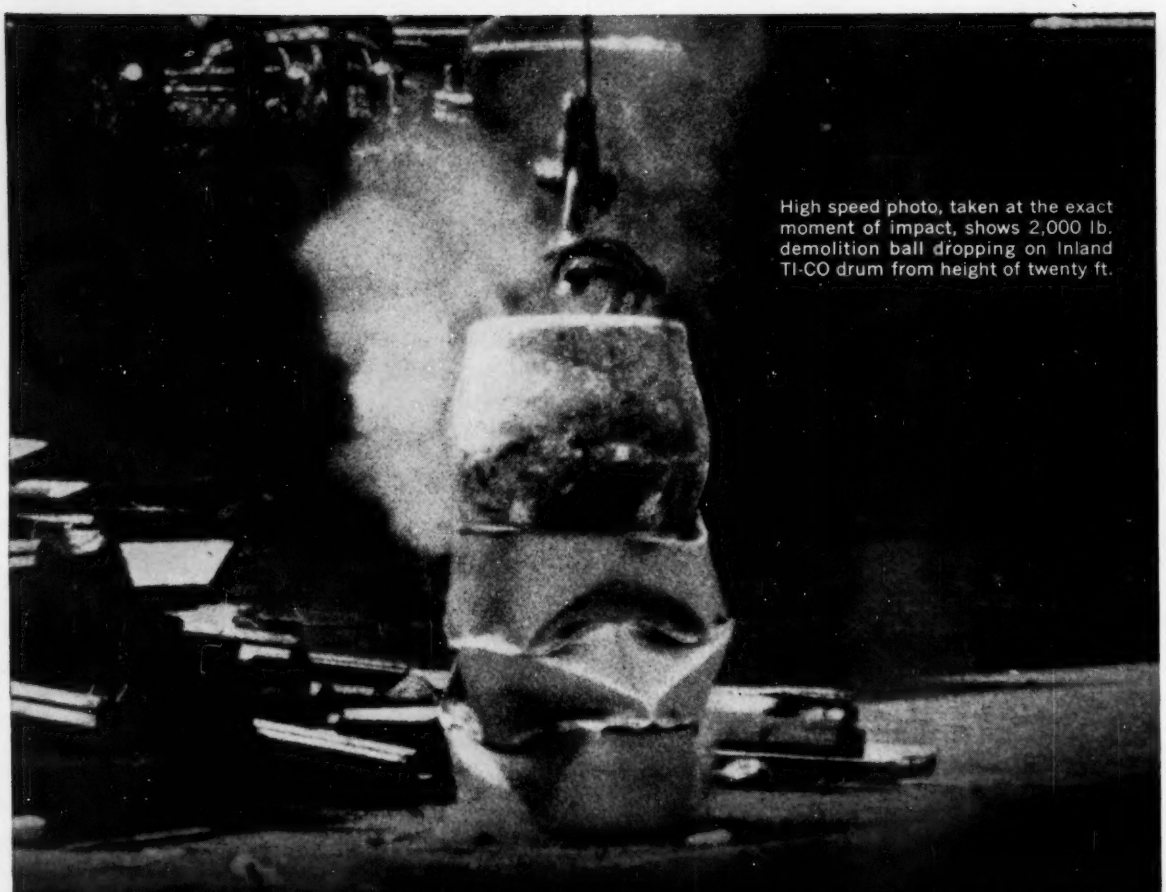
For further information, we suggest that you contact our Chemicals Executive Office in Baltimore.

MATHIESON CHEMICALS
OLIN MATHIESON CHEMICAL CORPORATION
INDUSTRIAL CHEMICALS DIVISION • BALTIMORE 3, MD.

INORGANIC CHEMICALS: Ammonia • Bicarbonate of Soda • Carbon Dioxide • Caustic Potash • Caustic Soda • Chlorine • Hydrazine and Derivatives Hyprochlorite Products • Muriatic Acid • Nitrate of Soda • Nitric Acid • Soda Ash • Sodium Chlorite Products • Sulphate of Alumina • Sulphur (Processed) Sulphuric Acid • ORGANIC CHEMICALS: Ethylene Oxide • Ethylene Glycols • Polyethylene Glycols • Glycol Ether Solvents • Ethylene Dichloride • Dichloroethylether Formaldehyde • Methanol • Sodium Methylate • Hexamine • Ethylene Diamine • Polyamines • Ethanolamines • Trichlorobenzene • Polychlorobenzene • Trichlorophenol

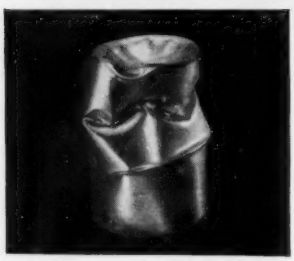
4186





High speed photo, taken at the exact moment of impact, shows 2,000 lb. demolition ball dropping on Inland TI-CO drum from height of twenty ft.

MURDEROUS 1 TON WALLOP FAILS TO FLAKE INLAND TI-CO* GALVANIZED DRUM



Close-up of drum used in demolition ball test. Not a single sign of flaking, inside or out.

It's a pretty good bet that the galvanized drums you are now using won't be subjected to the torture test shown above. It is good to know, though, that if they are Inland TI-CO drums, you'll never have to worry about the zinc coating flaking off to give rust a foothold. The container and its contents are protected . . . both inside and out . . . even under the "roughest" shipping conditions.

If you ship turpentine or other products that require a container with an all-over protective zinc coating, it will pay you to specify economical, all-weather Inland TI-CO Galvanized drums . . . the drums with the zinc coating that rolls with the punch.

Whatever your packaging problems, talk them over with an Inland container specialist.

Write Bob Boecher, Dept. 317A.

Full line of steel and stainless steel shipping containers, including galvanized and heavy duty ICC drums.

INLAND STEEL CONTAINER COMPANY

Division of Inland Steel Company, 6532 South Menard Avenue, Chicago 38, Illinois • Plants: Chicago, Jersey City, New Orleans, Cleveland and Greenville, Ohio.

**Registered trade mark of Inland Steel Company*

INLAND

"It's Better to Ship in Steel"

Santowax: Money-Saving Sleeper

With the "re-discovery" of waxy terphenyls—profit prospects in wax preparations shine brighter than ever. Here, wax users find, is that hard-to-find cost-cutter they've been looking for.

During the war, when the galaxy of available waxes dwindled to a few scattered stars, the waxy terphenyls came into their own. A spate of development in a dozen industries carved out several dozen places for these waxy solids that formulators are reviewing today—with an eye to analogous uses in applications that didn't exist in the early forties. Reason for the interest is: terphenyls are cheap, particularly if you can make do with a mixture of the isomers.

A mixture of *ortho-*, *meta-*, and *para-*terphenyls—sold by Monsanto under the trade name Santowax* R—is a light-buff, crumbly, waxy solid that has unusual stability to heat, acids, and alkalis. Most important, Santowax R is highly soluble in cheap solvents such as benzene or trichlorobenzene, is compatible with many expensive waxes. For these reasons, wax users find it's a money-saving extender for higher priced waxes, and a good modifier for wax blends. Its presence, for example, increases the chemical resistance of wax-base coatings and sealants, improves the electrical characteristics of wax impregnated insulation. Santowax R, itself, has a volume resistivity of 35,000 x 10^9 ohm-cm at 135°C.; a dielectric constant of 2.58.

Where the interest is beginning to broaden, however, is in the fields of adhesives and packaging. In waxed papers, reports one researcher, the presence of as little as 5% Santowax R in a .003" film reduces the moisture vapor transmission of the wrap *between 7 and 11 times*. In delayed-action, heat-sealing coatings, Santowax R acts as a solid plasticizer, and this same plasticizing action is also useful in a variety of hot-melt coatings.

Where one big market looms is in candlemaking, and several wax processors have shown interest in separating out the isomers for this special use. When the *ortho*, *meta*, and *para* isomers are separated from Santowax R—they fling open doors to a dozen special markets.

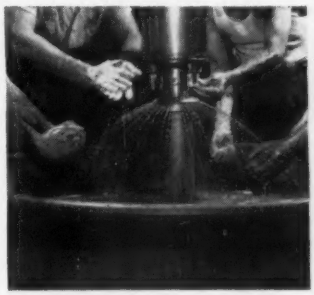
The *para* isomer has one of the highest melting points (213°C.) of any of the sharp melting point commercial waxes. It is one of the best-known opacifying agents for altar candles and raises the drip-point temperature for table candles. This high melting point puts it in high favor as an impregnant for electrical coils.

The *meta* isomer has a lower melting point (90°C.) but the presence of just 1% in candle compositions increases the miscibility between paraffin and beeswax, allows the candlemaker to use a cheaper grade of paraffin, and eliminates blisters and surface roughness.

The reason many formulators are dusting off the terphenyl waxes is not a change in their composition or availability—but the new requirements of wax applications today.

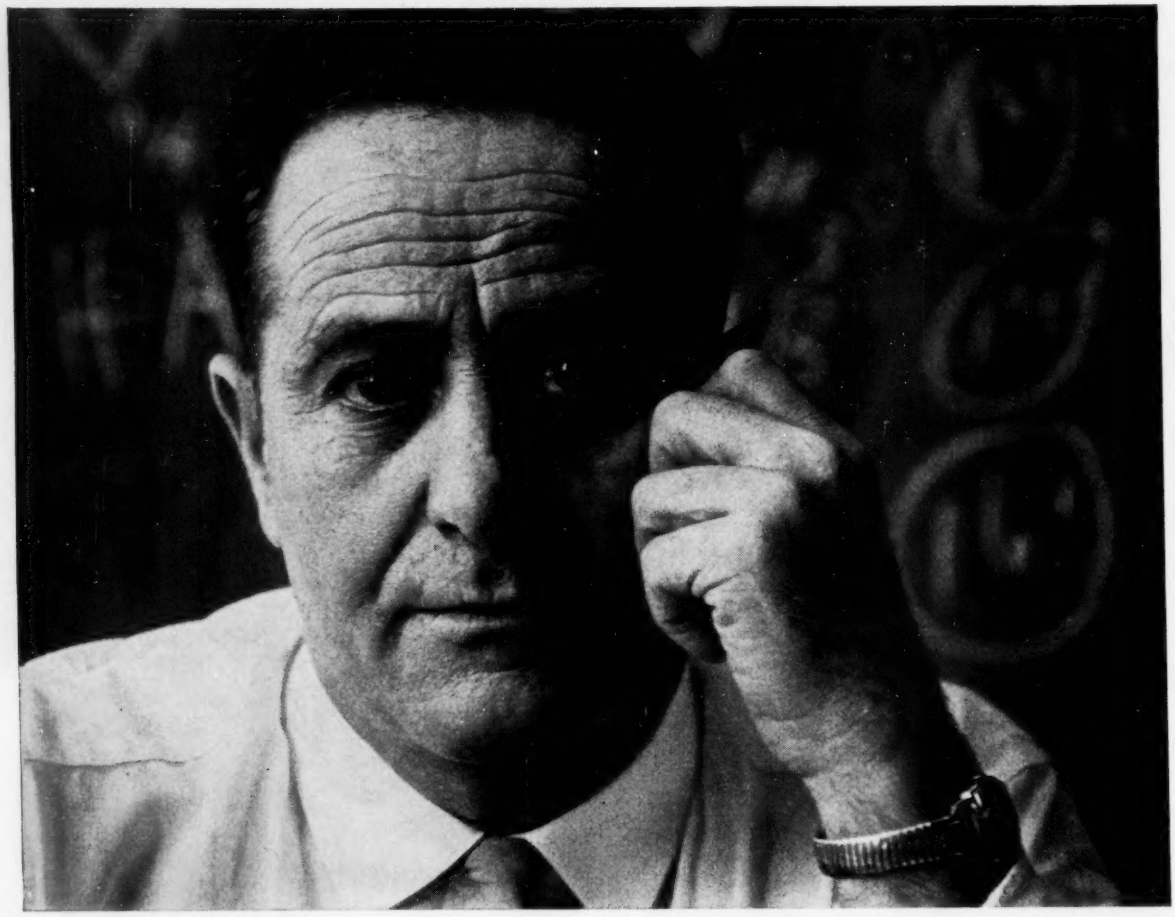
For more facts on Santowax and Actamer* (below), write today. Lab-size samples on request. Please do not request special formulations or reveal your formulation to us since this is your private, often most valuable, property. Write: Organic Chemicals Division, MONSANTO CHEMICAL COMPANY, Dept. CS-2, St. Louis 1, Missouri.

Reg. U. S. Pat. Off.



Industrial Soaps: New Sales Pull

Although it was reported (CW, Apr. 16, '55) bacteriostat-boosted soaps now total a fifth of the toilet-bar sales—the *fastest* acceptance has been in the field of specialty soaps. In the last year, some 21 makers of industrial powdered and liquid soaps and creme hand cleaners have added Monsanto Actamer to their products. Apparently, safety engineers in industrial plants see real value in removing resident skin bacteria, thus lowering chances of secondary infections from cuts and scrapes. The preparations with Actamer sell readily to antiseptic-minded buyers. Effectiveness of Actamer in degerming is attested by the toughest market of all: surgical soaps. Six companies have found soaps containing Actamer make the most effective scrub-up for doctors.



The Glycol Diethers bring out the best in our Mr. Rinelli . . . profit by it

Around Ansul we seldom see the *businessman* half of Bill Rinelli. He is usually so busy being Director of our Market Research and Development Division that this particular talent rarely comes to the fore. Some of our customers know differently. When working on a glycol diether application problem, Bill almost always wears two hats, *businessman* and *chemist*. He has helped to develop a number of marketable and highly profitable products using the glycol diethers. Examine these solvents carefully, then decide which Bill Rinelli you can use—businessman or chemist, or both. Write directly to him. Be sure to ask for a copy of our Glycol Diether Technical Bulletin. THE ANSUL CHEMICAL COMPANY, DEPT. C-11 MARINETTE, WISCONSIN.

ANSUL GLYCOL DIETHERS	
121	Dimethyl Ether of Ethylene Glycol $CH_3OCH_2CH_2OCH_3$ (1, 2 Dimethoxy, Ethane)
141	Diethylene Glycol Dimethyl Ether $CH_3(OCH_2CH_2)_2OCH_3$
161	Triethylene Glycol Dimethyl Ether $CH_3(OCH_2CH_2)_3OCH_3$
181	Tetraethylene Glycol Dimethyl Ether $CH_3(OCH_2CH_2)_4CH_3$ (Dimethoxy Tetraethylene Glycol)
222	Ethylene Glycol Diethyl Ether $C_2H_5OCH_2CH_2OC_2H_5$

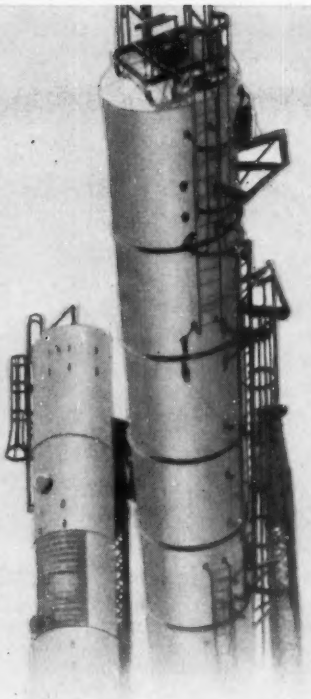
ANSUL

You should see what's inside!

If it were possible to see inside, the engineering skill and fabricating experience involved would be apparent. This 186-foot, 396,000-lb. tower is one of seven fabricated by Delta Tank for the American Cyanamid Company.

Delta's modern facilities are geared to produce the type of pressure equipment needed by the chemical, petro-chemical and petroleum industries. Delta's Baton Rouge plant is located right in the heart of the great new Gulf petrochemical area.

Complete information on Delta's facilities, or your specific equipment needs, is available at your request.



DELTA TANK MFG. CO. INC.

DELTA TANK MANUFACTURING CO., INC.

EXECUTIVE OFFICES: BATON ROUGE, LA.

EXPORT OFFICE: INTERNATIONAL TRADE MART, NEW ORLEANS, LA.

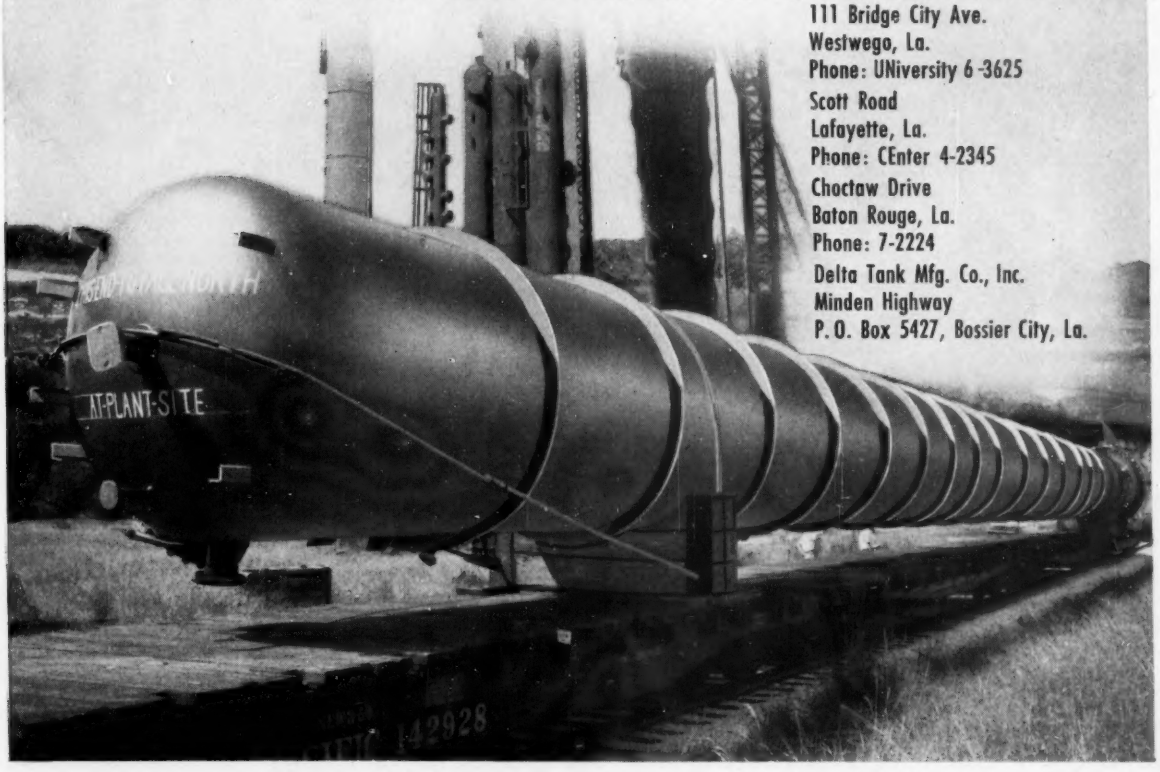
FABRICATORS OF PRESSURE VESSELS AND OIL FIELD EQUIPMENT

111 Bridge City Ave.
Westwego, La.
Phone: UNiversity 6-3625

Scott Road
Lafayette, La.
Phone: CEnter 4-2345

Choctaw Drive
Baton Rouge, La.
Phone: 7-2224

Delta Tank Mfg. Co., Inc.
Minden Highway
P. O. Box 5427, Bossier City, La.



Get Rugged Clear-Span Design • Luxury Look of Stran-Satin with

New Stran-Steel Rigid Frame Building Line

New Stran-Steel Rigid Frame buildings have the look of quality never before achieved in an all-steel building. However, quality doesn't stop with appearance . . . it is built *right* into every part of the structure.

Start with the smart *Stran-Satin* exterior finish. *Stran-Satin* metal wall, exclusive with Stran-Steel, provides a strong, durable panel with the weather resistance of zinc-coated steel and the smooth spangle-free look of expensive materials. Peaks, gables and eaves are completely enclosed with smart fascia flashing.

Under this smart appearance is a rugged steel structure. At the peak and knee, the continuously welded Rigid Frame I-section steel plate beams are securely bolted together. The frame is designed to put the assembly bolts primarily in *shear* rather than *tension*. At the foundation, each column is permanently bolted. Stran-Steel Rigid Frame buildings are clear-span structures available in widths of 40, 50, 60, 70, and 80 feet, and multiples thereof.

Unlimited design possibilities make these buildings ideal for warehouses, factories, retail or service centers. Fast, accurate assembly is made possible by precision punching and die forming. You get the cost-saving features of a pre-engineered structure in a quality building which is durable, fire-safe, easy to insulate and easy to heat.

For complete engineering details, call your local Stran-Steel dealer or send for the new Industrial Buildings Catalog.

Stran-Steel

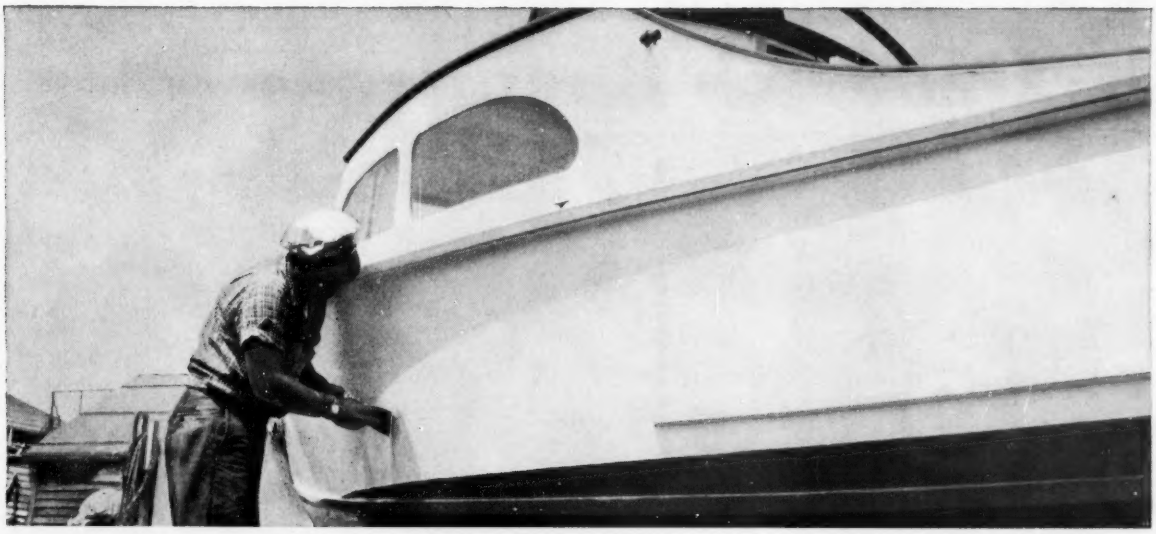
STRAN-STEEL CORPORATION

Ecorse, Detroit 29, Michigan • A Unit of

NATIONAL STEEL CORPORATION

Here is where to obtain Engineering Service:

Atlanta 3, Ga., 206 Volunteer Bldg. • Cleveland 15, Ohio, 20950 Center Ridge Rd. • Detroit 29, Mich., Tecumseh Rd., Ecorse • Houston 5, Tex., 2444 Times Blvd. • Minneapolis 4, Minn., 708 S. 10th St. • Kansas City 16, Mo., 1322 Burlington • San Francisco 4, Calif., 235 Montgomery St. • Washington 6, D.C., 1200 12th St., N.W.



Your **REMOVER** to take the coating **OFF**

or your **LACQUER** to put the coating **ON**

is superior when you manufacture with Enjay Ketones & Solvents

Whether your products take the coating off or put it on, they'll do it efficiently if they're formulated with Enjay ketones and solvents. Leading manufacturers rely upon the consistent high quality of Enjay active solvents to assure top performance from their lacquers, enamels, varnishes and removers.

For a dependable supply of methyl ethyl ketone, acetone and esters call on Enjay. For technical assistance in the application of *any* Enjay petrochemical, feel free to call on the new, fully staffed and equipped Enjay Laboratories.

Enjay offers a diversified line of petrochemicals for industry:

KETONES AND SOLVENTS (Methyl Ethyl Ketone, Acetone, Isopropyl Acetate, Secondary Butyl Acetate); and a varied line of LOWER ALCOHOLS, HIGHER OXO ALCOHOLS, OLEFINS AND DIOLEFINS AND AROMATICS.

ENJAY

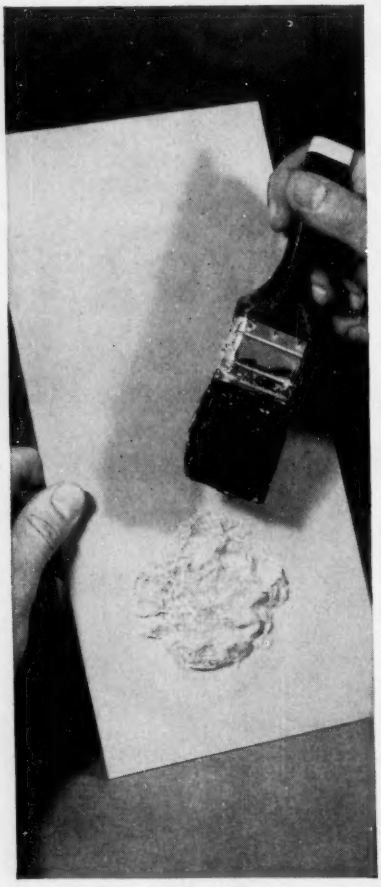
Pioneer in Petrochemicals

ENJAY COMPANY, INC., 15 WEST 51st ST., New York 19, N. Y. Other Offices: Akron, Boston, Chicago, Los Angeles, Tulsa

Another new development using

B.F.Goodrich Chemical *raw materials*

Applying paint remover in gel form is neater . . .



Paint blisters as solvent acts . . .

Paint remover and paint wiped off—no dripping.

NOW...PAINT REMOVER DEMONSTRATES HOW CARBOPOL* THICKENS ORGANIC SOLVENTS

THIS new paint remover formulation uses Carbopol 934 to provide desired viscosity, keep the remover from "running" or dripping, cut down evaporation. Equally important, the gel is a stable system, since Carbopol has outstanding resistance to aging.

You can use Carbopol in many other organic solvent systems, as well as in water systems. This unique suspending agent improves quality in cosmetic, pharmaceutical, paint, polish, and many related compounds. For complete information write Dept. S-9, B. F. Goodrich Chemical Company, 3135 Euclid Ave., Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

*Trademark Reg U. S. Pat. Off.

Good-rite CHEMICALS

B.F.Goodrich Chemical Company
A Division of The B.F.Goodrich Company

B.F.Goodrich GEON polyvinyl materials • HYCAR American rubber and latex • GOOD-RITE chemicals and plasticizers • HARMON colors

NH_3

3 more ammonia plants by Foster Wheeler

Three major petrochemical manufacturing companies have recently authorized Foster Wheeler to proceed with the design and construction of three Ammonia Synthesis Plants having a combined NH_3 production capacity of 585 tons/day. One of these plants will have a design capacity of 305 tons/day, the largest ever built by Foster Wheeler.

Hydrogen, for all three plants, will be separated from hydrogen-rich tail gas streams from nearby processing units.

These contracts reflect industry's approval of the Casale Process for Ammonia Synthesis and also Foster Wheeler's design, engineering and construction "know how". When these plants are completed, Foster Wheeler will have built —

9 NH_3 Synthesis plants with a combined capacity of **1585 T/D**

FOSTER WHEELER

NEW YORK • LONDON • PARIS • ST. CATHARINES, ONT.

when Flexibility is important in handling dry materials in bulk

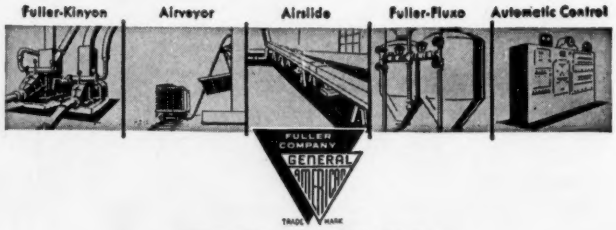
. . . call on Fuller

Fuller
. . . . pioneers in harnessing AIR

There's always an easier way of doing things, and one of the best examples you'll find anywhere is the ease with which Fuller conveying systems can be adapted to your plant for moving dry bulk materials in any direction, and any reasonable distance you might require, from Receiving to Storage to Process, thence to Shipping.

Materials flow up, down, horizontally, around corners—through walls, over areaways or streets, underground . . . anywhere a pipe line can be installed. The right combination of Fuller-Kinyon, Airveyor, Airslide, and Fuller-Fluxo systems, with a minimum of moving parts, can introduce into your plant operation a new dimension in materials handling.

Your first step toward better plant layout, efficiency, and materials handling economy is to write for Fuller's informative brochure, "How to Pull Dollars Out of Thin Air," filled with pictures of Fuller Equipment on the job. Do it today.



Fuller
. . . . pioneers in harnessing AIR

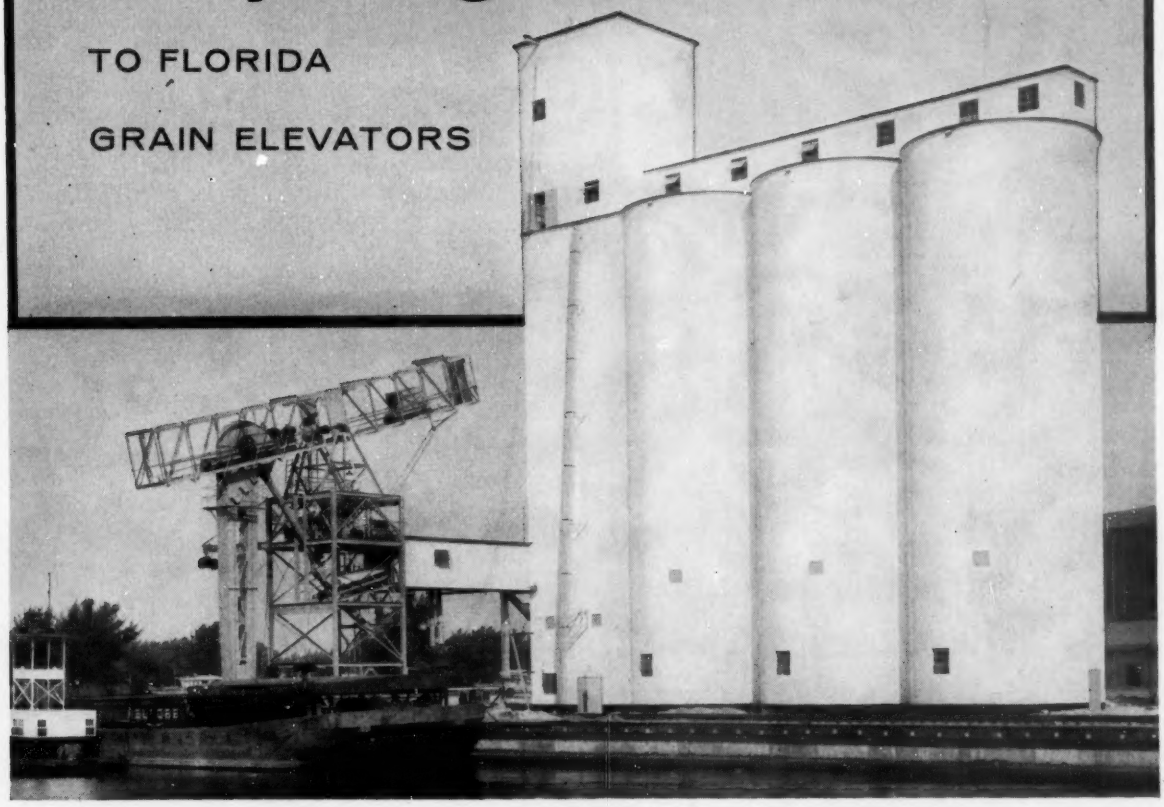
1544
6-117

FULLER COMPANY
144 Bridge St., Catasaqua, Pa.
GENERAL AMERICAN TRANSPORTATION CORPORATION SUBSIDIARY
Chicago • San Francisco • Los Angeles • Seattle • Birmingham

Polyco gives a lift

TO FLORIDA

GRAIN ELEVATORS



Special Coating Formulated by the Steelcote Manufacturing Company with a Polyco® Emulsion Solves Moisture Problems

When the Illinois Grain Company built grain storage elevators in Tampa, Florida, they used PLY-TEX #2, a special exterior paint produced by the Steelcote Manufacturing Company of St. Louis, Missouri, and formulated with a Borden POLYCO polyvinyl acetate emulsion.

This Steelcote product was specified for many reasons. It assures a glistening, white appearance, highly resistant to heat and salt-air corrosion. It's quick drying, tough, and has excellent adhesive qualities. Most important, this POLYCO-based paint serves a two-way purpose in moisture control. External moisture is prevented from penetrating the concrete structure while internal moisture absorbed by the concrete from the grain itself is allowed to escape through the surface coating in the form of vapor. This ability to let the pores of the concrete "breathe" means longer service life and less tendency to blister.

Many leading paint manufacturers like Steelcote are finding that POLYCO polyvinyl acetate emulsions lend unusually high mechanical stability, resulting in the widest possible versatility in formulation. And POLYCO-based paint can be produced with conventional equipment.

If you have a formulation problem, Borden's POLYCO might be the answer. Write today for a Borden specialist to visit your plant without obligation. Contact us at the address listed with our signature.

POLYCO-MONOMER DEPARTMENT

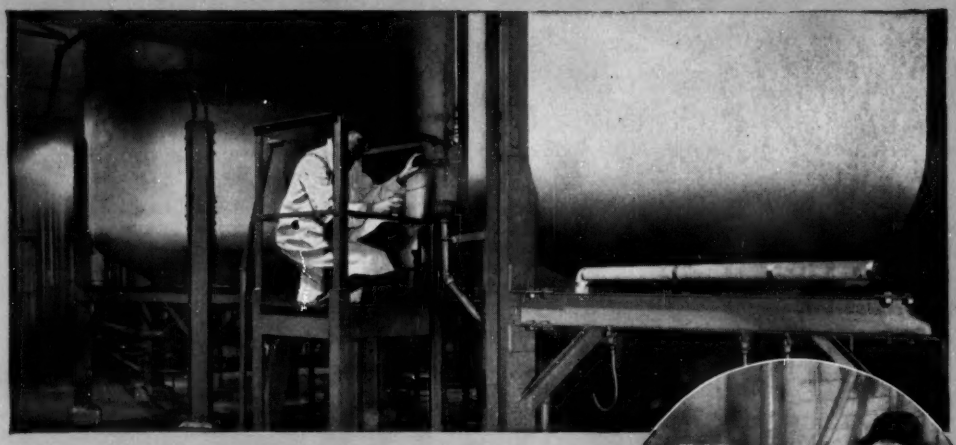
THE Borden COMPANY ©T.B.C.

CHEMICAL DIVISION

350 Madison Avenue, New York 17, N. Y.

Casein • Casein Stabilizers • Polymers • Adhesives • Resins

EPON® RESIN does it!



Paint job still sound after four years of 100% humidity, high temperature ... in antibiotics plant

All surfaces, except stainless steel, are protected by Epon resin-based paint formulated by David E. Long Corp., New York 17, N.Y.

HERE'S HOW...

PAINT LEADS A HARD LIFE in the steamy antibiotics plant of the New York Quinine and Chemical Works. Day in and day out, paint endures live steam and high temperatures. The coating on the processing equipment is exposed to hydrochloric acid and caustic soda. All surfaces take frequent hosing and scrubbing.

No ordinary paint would stand up to such usage. Epon resin-based coatings were applied in the Spring of 1952 throughout the plant . . . on walls and ceilings, on all metal piping except stainless steel, on all processing equipment. This Epon resin ester paint, dried at room temperatures, has given complete resistance to corrosion by chemicals and moisture, excellent adhesion to metals, plaster and concrete, and because of its glossy finish has reduced dust settling.

Four years after it was brushed on, the Epon resin paint looks sound and new. And the Chief Engineer has no intention of repainting this year!

If you have a paint maintenance problem . . . where ordinary paints just can't take it—ask your paint supplier for Epon resin-based paint. You'll find that it is unsurpassed as an all-purpose industrial coating! Call on Shell Chemical sales offices for names of suppliers. Write for the full Epon resin coatings story, "Planning to Paint a Pyramid?"

Epon resins are the epoxy polymers made exclusively by Shell Chemical Corporation.

SHELL

SHELL CHEMICAL CORPORATION

CHEMICAL SALES DIVISION

380 Madison Avenue
New York 17, New York

Atlanta • Boston • Chicago
Cleveland • Detroit • Houston
Los Angeles • Newark • New York
San Francisco • St. Louis

IN CANADA
Chemical Division, Shell Oil Company of Canada, Limited
Toronto • Montreal • Vancouver

How big are Pitt Consol's coal carbonization plans? That question, asked ever since the details were first revealed on the Olin Mathieson aluminum smelter near New Martinsville, W. Va. (*CW Business Newsletter, Jan. 28*), has now been answered. The carbonization plant, which will produce char to be used in generating power for aluminum refining, will also turn out some 65 million gal./year of coal liquids. Pitt Consol will spend about $25 million for its carbonization unit and refining and processing equipment for the liquids. Estimated yearly coal throughput: 2.5 million tons.

Also on the expansion front, Central Farmers Fertilizer (Chicago) will begin construction next spring of its $10-million phosphate mine, electric furnace and dicalcium phosphate plant at Georgetown, Idaho. CFFC owns 2,400 acres of rich phosphate rock lands in Georgetown Canyon.

There are more details, too, on another phosphate project. Monsanto has begun construction of a phosphoric acid unit at Pueblo, Colo., that will be operated by Colorado Fuel & Iron Corp, (*CW Business Newsletter, Aug. 4*). Output will be used to capture ammonia from CFI's adjacent battery of 266 coke ovens. CFI will market the resulting diammonium phosphate. Elemental phosphorus from Monsanto's Soda Springs, Idaho, furnace will be used in making the phosphoric. Plant completion is expected late this year.

Recently merged Union Bag-Camp Paper Co. has optioned 4,500 acres of woodland near New Bern, N. C., as possible site for a pulp and paper mill that could cost $50 million or more. Determining factors: whether enough water of suitable quality is available, and whether waste disposal can be arranged to the satisfaction of local and state officials.

An air pollution committee may be established at Ashtabula, where residents have been complaining about discharges into the air by chemical and other plants (*CW, July 21, p. 30*). The committee would make recommendations as to solution of present problems. Too, the group would let companies thinking of locating near or in Ashtabula know of standards that should be maintained so they can incorporate required pollution abatement equipment in new construction.

•

That explosion at Niagara Falls has had a new reverberation (*see pp. 70, 90; also see CW Business Newsletter, Aug. 11*). The town board of neighboring Grand Island, N. Y., has reserved decision on a change in the town's zoning laws that would permit construction of industrial laboratories. Hooker Electrochemical wants the change so it can build a research lab there. The point at issue: whether the 5-acre minimum proposed in the zone law amendment is large enough to protect nearby residents from explosion. Hooker has optioned 130 acres for its lab.

Also on the legal scene—Three judges of the U. S. Court of Appeals in New York have unanimously ruled that the government was correct in banning from food use the coal-tar colors FD&C Red 32 and Oranges #1 and 2 (*see*

p. 33). The court, "without analyzing the scientific data in the record," declared the colors "alarmingly toxic . . . the least toxic of the three colors in question has serious immediate effect on human beings . . . the over-all effect on laboratory animals by proof of autopsy was alarming. . . ."

Under scrutiny: an order by Health-Education-Welfare Secretary Marion Folsom removing the three colors from the list of those suitable for food use. Appealing: an industry committee on certified colors and eight individual manufacturers: Allied Chemical, American Cyanamid, Bates Chemical, Dyestuffs & Chemicals, H. Kohnstamm, William J. Stange, Sterwin Chemicals and Warner-Jenkinson.

•

Dow Chemical's plants at Freeport were getting back into production this week following a 34-day strike that ended at 11:50 p.m. last Thursday. Workers belonging to 11 unions have accepted new three-year contracts that provide for a minimum wage increase of 20¢/hour, with a further 10¢/hour to become effective one year from now. Though the contracts run through June 1, 1959, they may be reopened for wage negotiations a year earlier.

Also granted: a seventh paid holiday, rises in shift differentials, changes in seniority rules, compensation for funeral leave and jury duty, and improved sick-leave benefits.

Two other strikes are in the news. A walkout—termed unauthorized by United Mine Workers District 50 leaders—disrupted work at Allied's National Aniline Division plant at Moundsville, W. Va. And workers in the coke division of Tennessee Products & Chemicals' plant at Chattanooga, also represented by UMW, left their jobs when their contract expired Aug. 2.

•

President Eisenhower last week rejected Sumner Chemical's plea for a boost in tariffs on *p*-amino salicylic acid and its salts. He thus went along with three (of the six) members of the Tariff Commission who had concluded that there were no grounds for a rise in tariffs to help domestic PAS producers. The other three members had recommended a duty rise from 3.5¢/lb. and 25% ad valorem to 5¢/lb. and 35% ad valorem.

Under the so-called "escape clause" of the Trade Agreements Act, an industry that feels it is being injured or may be injured may seek relief from the government. Since the Tariff Commission split 3-3 on need for such relief, the President may accept either recommendation.

•

Jefferson Lake Sulphur plans to merge Merichem Co. into its operations. Already 94% owned by Jefferson, Merichem would become the parent firm's petrochemical division.

Also on the merger front: Stauffer Chemical has bought out Harshaw's interest in two companies that had been jointly owned—the New York-Ohio Chemical Corp. and Nyotex Chemicals, Inc. A primary product of both companies: anhydrous aluminum chloride.

And that proposed merger between Reichhold and Catalin will come up for a vote by Catalin stockholders at a special meeting Oct. 1.

BRIEFS for buyers of

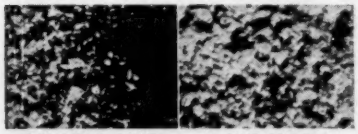
Aluminum Chloride
Caustic Potash
Carbonate of Potash
Sodium Sulfhydrate
Muriatic Acid

Why we air-condition aluminum chloride. Ever notice how aluminum chloride kicks up in rainy weather?

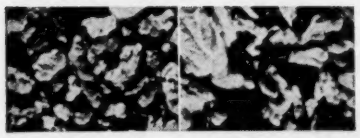
This widely-used chemical reacts swiftly with humid air, losing its value as a catalyst or reactant. On damp days, your production people have to use extra caution to keep it sealed up tight.

This problem bothers us, too—or used to. In fact, there was a time when we didn't even *try* to make aluminum chloride on humid days.

Air conditioning came to the rescue. Now we can make aluminum chloride, anhyd., all year long in a controlled dry atmosphere—so you can always get it at full strength, come rain or shine.



EXTRA FINE GRIND FINE GRIND



COARSE GRIND COARSE SCREENED

You can get Hooker aluminum chloride in any of the four sizes shown here. For technical data, just check the coupon.

Two new Hooker chemicals. You can now buy caustic potash and carbonate of potash from Hooker, under the trademark *Nialk*®.

Nialk Caustic Potash is available in 45% to 52% solutions, and in the following solid forms as 90% and as 85% (low chloride) material: solid, flake, granulated, broken, crushed, powdered, and walnut.

Nialk Carbonate of Potash is supplied in 48% and 52% solutions, and in solid forms as 83.5% to 84% hydrate, and as calcined (less than 1% H_2O).

If you already use these Nialk chemicals, we assure you they will be made to the same rigid specifications as always.

If you buy *other* Hooker chemicals, and also use caustic potash or carbonate of potash, you can now get the benefit of a consolidated source of supply.

And if you aren't a Hooker customer now, we hope these chemicals will give you two more reasons to become one.

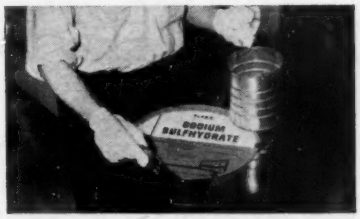
In any case, the nearest Hooker sales office will gladly answer any questions you have about these and other Nialk products.

How long can you store sodium sulfhydrate? A while ago a tanner came across some Hooker sodium sulfhydrate which he had stored accidentally for over four years.

It looked OK, so he used it.

Results? "Excellent," says the tanner. No appreciable iron contamination in four years!

Such long-lived purity is no accident when you buy Hooker sodium sulfhydrate or sodium sulfide.



We package sulfides in brand-new steel drums with a 1/64-inch lining of lacquer to prevent iron pickup. We lacquer the drum lid, too, and secure it with six sturdy lugs so it stays airtight until you break the seal.

Extra caution is used before the sulfide goes into the drum. We control raw materials, using only our own caustic soda and hydrogen sulfide.

That's why you always get sulfides that dissolve swiftly into pure, sediment-free solutions when you specify Hooker.

Quick guide for muriatic acid solutions. A mark on the coupon below will bring you a technical data sheet that shows at a glance how much muriatic acid you need to make up various volumes of different Baumé solutions.

The same sheet also gives some good advice on the safe handling of muriatic acid, and the specifications of Hooker muriatic.

A quick glance at the specs is likely to convince you that the purest muriatic you can buy in volume anywhere is "Hooker White" grade. Entirely free of arsenic, it contains no more than .003% sulfates, .0001% iron.

Like our standard grade, "Hooker White" is shipped in 13-gallon glass carboys and in rubber-lined tank cars, in 18°, 20°, and 22° Baumé.

For more information on chemicals mentioned here, check below:

- ☐ Aluminum Chloride, anhyd.
- ☐ Caustic Potash
- ☐ Carbonate of Potash
- ☐ Muriatic Acid
- ☐ Sodium Sulfhydrate
- ☐ Sodium Sulfide

Is your data file up-to-date on these other Hooker products in regular supply? Check for technical data:

- ☐ Benzoic Acid, U.S.P. & Tech.
- ☐ Sodium Benzoate, U.S.P. and Tech.
- ☐ Caustic Soda
- ☐ Lauryl Chloride
- ☐ Sulfur Dichloride
- ☐ Sulfur Monochloride

Clip and mail to us with your name, title, company address.

When requesting samples, please use business letterhead to help speed delivery.

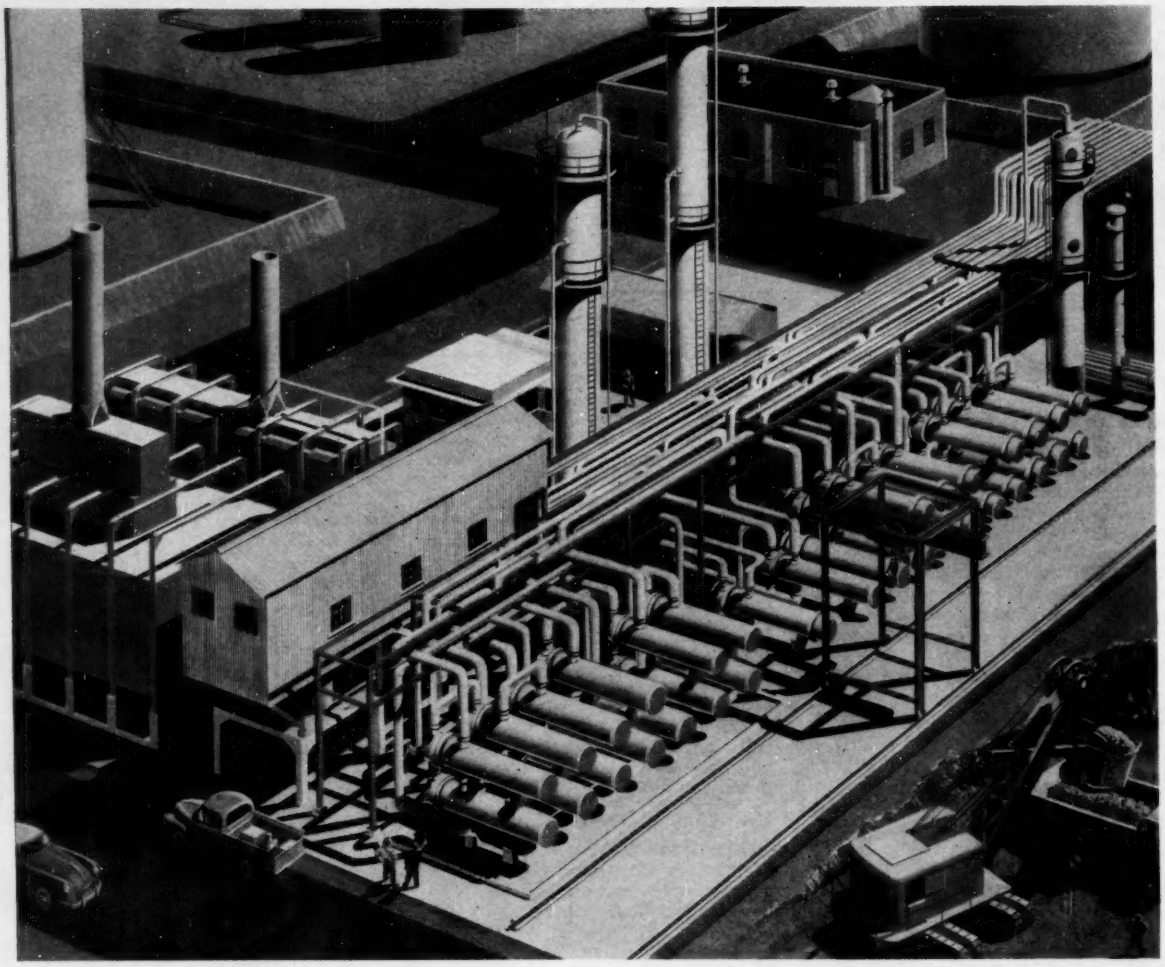
HOOKER CHEMICALS PLASTICS

HOOKER ELECTROCHEMICAL COMPANY

7082 FORTY-SEVENTH ST., NIAGARA FALLS, N. Y.

NIAGARA FALLS • TACOMA • MONTAGUE, MICH. • NEW YORK • CHICAGO • LOS ANGELES

8-863



not one... but two 15,000 b/d CATFORMERS for ATLANTIC

Blaw-Knox is designing and constructing two Catformers and Unifiners for THE ATLANTIC REFINING COMPANY. One to be installed in their Philadelphia refinery, the other for Atreco, Texas.

The units are identical, each having a reforming capacity of 15,000 barrels per day.

To save both construction time and costs, this project was planned to take advantage of the engineering work for the first unit by adapting it directly to the second installation.

The background and experience of Blaw-Knox engineers in catalytic reforming and hydrogen treating, as well as other petroleum processes, are available to you in your expansion or new refinery plans. We welcome the opportunity to make recommendations.

50th Anniversary BLAW-KNOX 1906-1956

BLAW-KNOX COMPANY Chemical Plants Division

Pittsburgh 30, Pennsylvania • Chicago 1, Illinois

Birmingham, New York, Philadelphia, San Francisco, Washington, D. C.

Chemical Week

August 18, 1956 *Vol. 79, No. 7*

Publisher ..... Wallace F. Traendly
Editorial Director ..... Sidney D. Kirkpatrick
Editor ..... Howard C. E. Johnson
Associate Managing Editors ..... Ralph R. Schulz
Edward T. Thompson

ASSOCIATE EDITORS

Marketing ..... Anthony J. Piombino
Technology ..... Donald P. Burke

DEPARTMENTS

Administration ..... Homer Starr, *editor;* Leo J. Northart
Business News ..... William Olcott, *editor;* Cooper McCarthy
Robert L. Porter
Marketing
Markets ..... Jorma Hyypia, *editor;* Frank S. Sciancalepore
Sales ..... John M. Winton, *editor;* Richard J. Callahan
Reports ..... Vincent L. Marsilia, *editor*
Specialties ..... J. R. Warren, *editor;* Charles Joslin
Technology
Production ..... Kenneth Wilsey, *editor;* Herbert C. Short
Research ..... Joseph F. Kalina, *editor;* Emil J. Mikity
Copy ..... William Mullinack, *editor*
Art ..... Donald R. Thayer, *director;* Peter Madden
Buyers' Guide ..... Alvin J. Babkow, *manager*

REGIONAL EDITORS

Midwest ..... Frank C. Byrnes, Chicago
Far West .. Elliot Schrier, San Francisco
Southwest ..... James A. Lee, Houston

EDITORIAL ASSISTANTS

Magnhild Lovaas — Kay Sebiry
Eleanor Sternecker — Frances Regan

NATIONAL NEWS

Economics .. Dexter M. Keezer, *director*
Douglas Greenwald, Robert P. Ulin
Atlanta ..... A. R. Henry
Cleveland ..... Robert E. Cochran
Detroit ..... Harry Homewood
Los Angeles ..... John Shinn
San Francisco ..... Margaret Ralston
Washington .... George B. Bryant, Jr.

Correspondents in 73 principal cities.

WORLD NEWS

Editor ..... John Wilhelm
Bonn ..... Gerald W. Schroder
London ..... William J. Coughlin
Melbourne ..... Alicja Grobtuch
Mexico City ..... John H. Kearney
Paris ..... Robert E. Farrell
Rio de Janeiro ..... Peter Weaver
Tokyo ..... Dan Kurzman

Correspondents in 44 principal cities.

Advertising Director ..... Robert S. Muller

Advertising Sales Manager Steven J. Shaw
Business Manager .. Anton J. Mangold
Advertising Salesmen .... See page 106

Promotion Manager .. E. A. Atwood, Jr.
Market Research Manager A. I. Losick
Market Service Manager .. J. E. Zingale

Chemical Week (including Chemical Specialties and Chemical Industries) is published weekly by McGraw-Hill Publishing Company, Inc. James H. McGraw (1860-1948), founder. Executive, Editorial and Advertising Offices: McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y. Publication Office: 1309 Noble St., Philadelphia 23, Pa. Donald C. McGraw, President; Paul Montgomery, Executive Vice-President; Joseph A. Gerardi, Vice-President and Treasurer; John J. Cooke, Secretary; Nelson Bond, Executive Vice-President, Publication Division; Ralph B. Smith, Vice-President and Editorial Director; Joseph H. Allen, Vice-President and Director of Advertising; J. E. Blackburn, Jr., Vice-President and Circulation Director.

Subscriptions to Chemical Week are solicited from management men in the chemical process industries. Position and company connection must be indicated on subscription order. Address all subscription communications to Chemical Week Subscription Service, 330 W. 42nd St., New York 36, N.Y., or 1309 Noble St., Philadelphia 23, Pa. Allow one month for change of address.

Single copies, 35¢. Subscription rates—United States, United States Possessions and Canada, $3.00 a year; $4.00 for two years; $5.00 for three years. Other Western Hemisphere countries, $15.00 a year; $25.00 for two years; $30.00 for three years. All other countries, $25.00 a year; $40.00 for two years; $50.00 for three years.

Second class mail privileges authorized at Philadelphia, Pa.

Copyright 1956 by McGraw-Hill Publishing Co., Inc. All rights reserved.

Your guarantee of

PURITY
SERVICE
UNIFORMITY

FOREMOST FOOD AND CHEMICAL CO.
EL DORADO DIVISION

COCONUT OIL
FATTY ACIDS &
METHYL ESTERS

FATTY ACIDS

Caprylic	Eldhyco*	Capric
Lauric	Coconut	Myristic
	Palmitic	

METHYL ESTERS

Caprylate	Eldo 18*	Caprate
Laurate	Coconate	Myristate
Caproate		Palmitate

*T. M. Reg.

For example:

ELDO CAPRIC ACID

94-97% pure. Readily available at an attractive price. Eldo's high standards give you a better, more uniform end product.

For samples and specifications, write Dept. W

FOREMOST FOOD AND CHEMICAL CO.
EL DORADO DIVISION

P.O. Box 599, Oakland 4, California

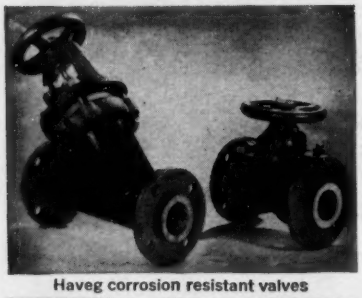
In New York: H. Reisman Corp.
In Detroit: Harry Holland & Son, Inc.
In Chicago: M. B. Sweet Co.
In Cincinnati: Howard Dock
In Cleveland: F. W. Komin Co.

HAVEG® News

Wherever CORROSION RESISTANCE is a Factor

IF CORROSION IS THE PROBLEM HAVEG PLASTICS ARE THE ANSWER!

Haveg storage tank installation



Haveg corrosion resistant valves

Large Haveg polyester glass self-supporting fume hood

Haveg light weight polyester glass tanks

Rugged strength and durability . . . exceptional resistance to corrosion . . . longer, trouble-free service at process temperatures as high as 350°F.—you get them all at bonus savings in installation time, material, and maintenance costs with Haveg plastic equipment. .

PROCESS PIPE, TANKS, TOWERS, FUME REMOVAL SYSTEMS, DISTILLATION COLUMNS, FILTER PRESS PLATES—wherever industrial equipment is required to handle corrosive materials or atmospheres—Haveg corrosion resistant plastics have solved the problem at leading process plants. In addition to equipment a wide selection of Haveg resin cements offer required chemical resistant properties for extensive use as mortar in chemical brick and tile flooring, equipment lining, etc.

Haveg phenolic, furan, polyvinyl and polyester resins are selectively formulated to provide maximum resistance to the corrosive chemicals used in your particular operations . . . acids, hypochlorites, chlorinated solvents, salts, alkalies, hydrocarbons, and a variety of oxidizing agents. Excellent machining and molding characteristics permit economical fabrication of a wide range of intricate shapes and sizes to meet exacting specifications. Write for illustrated Bulletin C-13.

HAVEG DESIGNS, ENGINEERS, BUILDS YOUR PROCESS EQUIPMENT

Skilled Haveg corrosion engineers, experienced in designing and engineering corrosion resistant equipment for diverse industrial applications, will develop equipment to meet your process needs . . . to assure you full advantage of Haveg's low cost methods. Designed and fabricated to your specific requirements, each Haveg installation is guaranteed to give top process performance! Details of this unusual service are available at no obligation from a qualified Haveg sales representative. H-602

HAVEG PLASTICS OF TOMORROW SOLVE YOUR CORROSION PROBLEMS TODAY

HAVEG INDUSTRIES, Inc. 920 Greenbank Road, Wilmington 8, Delaware
Factory: Marshallton, Del. phone WYman 8-2271

Atlanta Exchange 3621 | Chicago (Wheaton) Wheaton 8-3225 | Cleveland WAshington 1-8760 | Detroit (Livonia) KEnwood 1-1785 | Houston JAckson 2-6840 | Los Angeles Mutual 1105 | New York (Westfield, N.J.) WEstfield 2-7383 | Seattle Main 9006

OPINION

New Role for Rubber

TO THE EDITOR: . . . It would look to me as though you had done a very creditable job in publicizing the work that Dr. Bateman and his co-workers have been doing [*CW, July 14, p. 48*] in the field of derivatives prepared from natural rubber. I would think that the article would create a great deal of interest among your readers . . .

A. M. NEAL
Assistant Director
Elastomers Laboratory
E. I. du Pont de Nemours & Co., Inc.
Wilmington, Del.

Organic Complaints

TO THE EDITOR: Two pages on the value of house organs (*July 28*) and no mention of *The Houghton Line*—the oldest company publication in this field.

But Houghton is not a chemical manufacturer? We are still in the oil business, but increasingly chemical; for example, defoamers, surface-active agents, emulsifiers, hydraulic fluids, textile softeners and resins.

Who says we're not to be rated with those you mentioned? Especially when *The Houghton Line* began publication in 1908, has a circulation of 195,000 and sells so well we couldn't do without it.

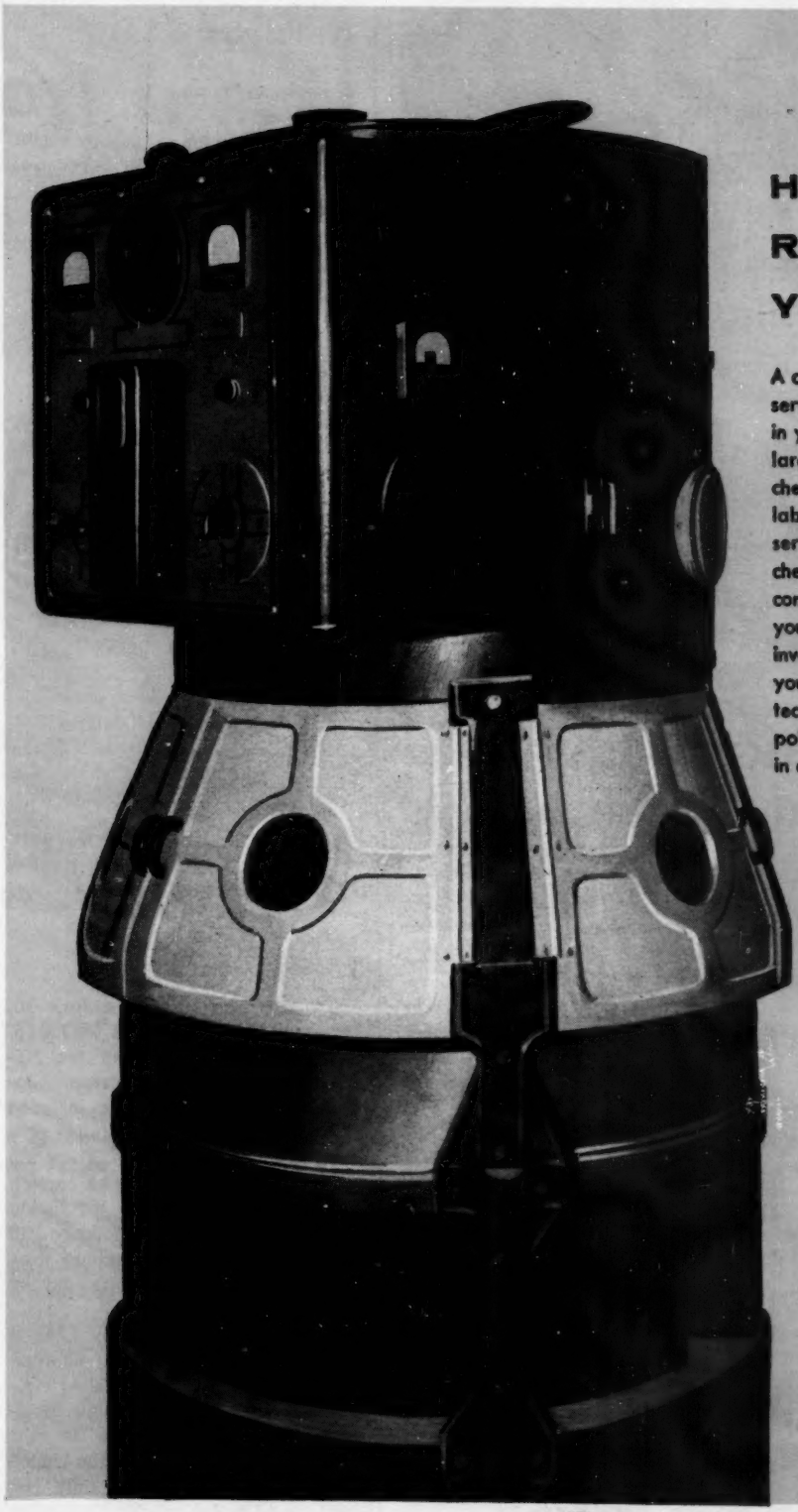
Aren't you sorry now?

D. C. MINER
Advertising Manager
E. F. Houghton & Co.
Philadelphia

TO THE EDITOR: Your coverage (*July 28*) of *glossy* house organs offered by chemical companies failed to note (or to contrast) J. T. Baker's informative *Chemist-Analyst*. In 1911, the initial issue of this journal reached 860 chemists! Today, each quarterly issue is sent free-of-charge to over 60

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: H. C. E. Johnson, Chemical Week, 330 W. 42nd St., New York 36, N.Y.



HARD-WORKING ROBOTS AT YOUR SERVICE

A call to Barrett's technical service staff triggers fast action in your behalf. As America's largest producer of coal-tar chemicals, we reserve extensive laboratory facilities for your service. Our experienced chemists and engineers will come right into your plant, if you like, to help with problems involving our products. Since you pay no more for Barrett technical service, make it a point to call on us for the finest in coal-tar chemicals.

This machine is used by Barrett Technical Service Laboratories to test the ultra-violet resistance of vinyls and other materials.

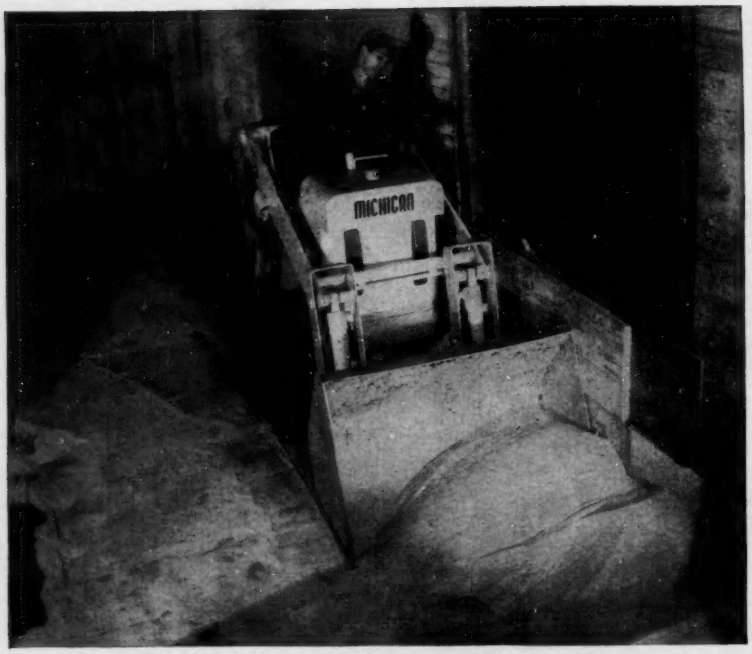
Barrett®

BARRETT CHEMICALS

BARRETT DIVISION, Allied Chemical & Dye Corporation, 40 Rector Street, New York 6, N. Y. In Canada: The Barrett Co., Ltd., 5551 St. Hubert Street, Montreal, Que.

Allied Chemical

OVER 100 YEARS OF EXPERIENCE



Speeds cycles, cuts bulk handling costs . . .

Only the MICHIGAN 12B gives you power-shift transmission

Power-shift transmission is standard equipment on the 15 cu. ft. MICHIGAN Model 12B—no engine clutch, no pedal, no gear clash. MICHIGAN is the only Tractor Shovel in this size range with power-shifting. Instead of wrestling with a conventional shift-lever and clutch pedal, the operator simply pushes a single lever on the steering column—like a modern car. High, low or reverse—make any shift instantly, even when travelling.

Entirely new power-train. For the constant stop-and-go, forward-reverse cycles of industrial bulk handling, Clark has designed and built an entirely new power-train for the Model 12B. This exclusive power-train is a completely integrated package, with each component matched to the others:

Torque converter multiplies engine torque up to 300%—provides the extra push to climb grades or penetrate tight material.

Power-shift transmission makes all shifts hydraulically—cuts vital seconds off every cycle.

Planetary-wheel drive axle takes 70% of the torque load off the axle shaft—eliminates broken axles.

Not only does this power-train package make the MICHIGAN faster and easier to operate, it eliminates all the maintenance associated with an engine clutch and pedal. Furthermore, you deal with one single source for design, manufacture and service of all basic components.

Make your own comparison. The MICHIGAN Model 12B is simply more machine than any Tractor Shovel in its class. It is heavier and more powerful; it has low-level bucket action, complete dust protection features, and the exclusive Clark power-train. Before you buy an industrial Tractor Shovel, see this one in action. Write to arrange a demonstration of the MICHIGAN Model 12B on any job you name; clip the coupon to your letterhead and we'll do the rest.

Michigan is a registered trade mark of

CLARK® EQUIPMENT

Arrange demonstration of Model 12B:

CLARK EQUIPMENT COMPANY
Construction Machinery Division
2459 Pipestone Road
Benton Harbor 30, Michigan

OPINION

countries and to some 39,000 scientists, companies, and institutions requesting it. A permanent file of *Chemist-Analyst* is maintained (and consulted frequently) in numerous libraries, laboratories, and by chemists themselves (from Auckland to Zagrab and from Alaska to Zanzibar). The J. T. Baker company journal is believed to be the only periodical distributed by a chemical company that is digested by most major scientific abstracting and indexing services the world over.

"Glossy" and product-focused house organs do build sales. However, the 51 years of growth of J. T. Baker Chemical Co. as a producer of purity chemicals and its 45-year publication of *Chemist-Analyst* do attest that customers appreciate receiving a journal that publishes research findings in their area of interest and is international in scope—in the viewpoint of both reader and contributor. . . .

A. J. BARNARD, JR.
Director, Technical Information, and Editor
J. T. Baker Chemical Co.
Phillipsburg, N.J.

Hats off to two fine house organs! But readers Miner and Barnard will concede, we're sure, that we couldn't name every one.—ED.

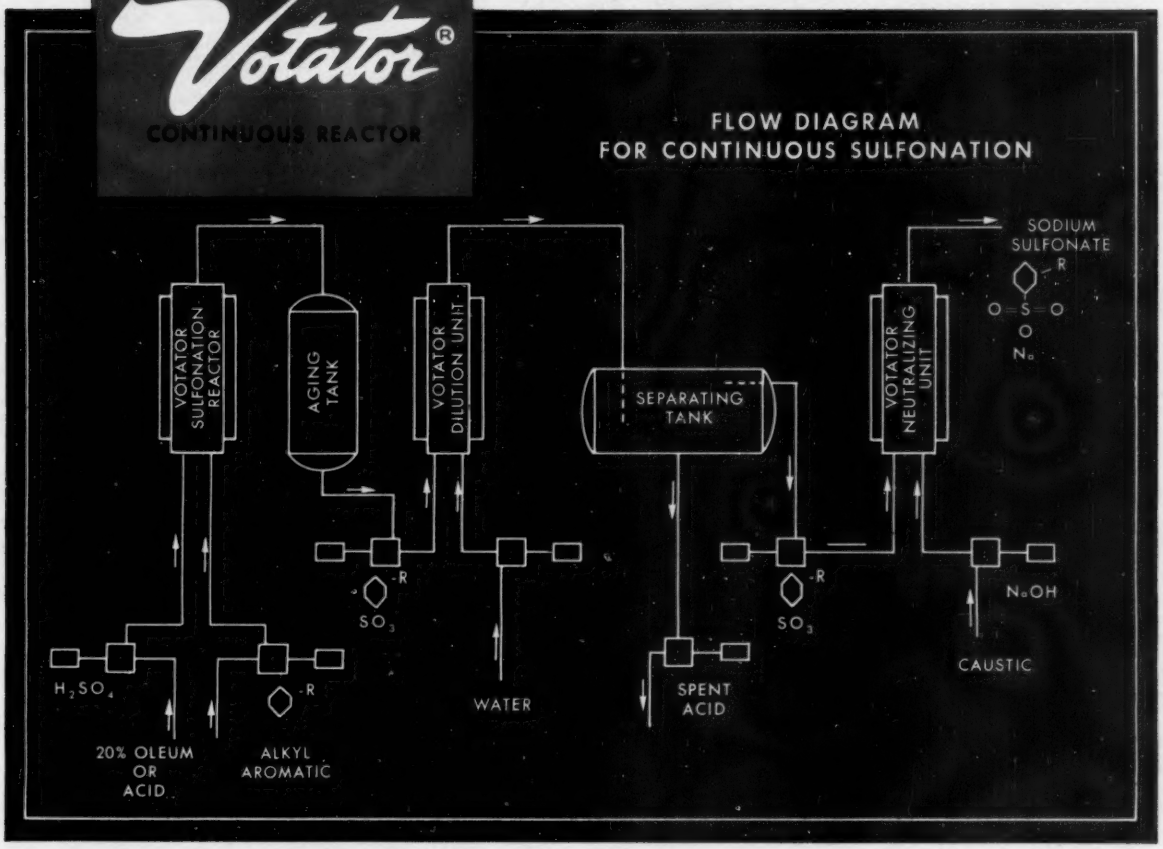
Fission Figures

TO THE EDITOR: In the June 30, 1956, issue of CHEMICAL WEEK, p. 80, comments taken from the National Academy of Science report concerning waste disposal are included in the section dealing with future production of fission products. There are gross errors, which I wish to correct. The numbers you quote for fission product production are as follows: "20 lbs./day by 1965; 200 million lbs./day by 1980; 2.4 billion lbs./day by 2000."

The 20-lbs./day figure by 1965 is correct if one assumes that approximately 10,000 mw. of installed electric power exists at that time. However, the same prediction for the growth of nuclear power in the United States would indicate that only 160 lbs./day of fission products would be produced in 1980, based upon an installed capacity of 80,000 mw. of nuclear heat. Similarly, in the year 2000, when this same prediction would indicate an installed reactor heat capacity of 1-million mw., only about

Votator®

CONTINUOUS REACTOR



Controls heat of reaction for processing viscous and heat sensitive materials

• If reaction temperature is your problem—you may profit from the experience of polymer manufacturers. They are now improving a wide range of products, stepping up reaction rates and increasing product uniformity with VOTATOR* Continuous Reactors.

Also, recent pilot plant studies in sulfonation indicate that VOTATOR Continuous Reactors simplify and improve this processing. A flow diagram of this Girdler pilot plant is shown above. Other suggested applications are sulfation, nitration and saponification.

Key to the efficient, low-cost operation of the VOTATOR Continuous Reactor is its rapid heat transfer rate. Over-all heat transfer coefficients of 200 to 500 BTU/(hr) (sq. ft.) (°F) are not uncommon. This high heat speed transfer, coupled with simultaneous scraped-surface turbulent agitation gives precise control of reaction temperatures and permits you to heat or cool reactants in seconds . . . even those of high viscosity or heat sensitivity.

Find out how this compact, automatic equipment can *improve* your processing and *cut* your costs. Write today for further data. The Girdler Company, Votator Division, Louisville 1, Kentucky.

*VOTATOR—Trade-Mark Reg. U. S. Pat. Off.

CHECK THESE ADVANTAGES:

- Highly efficient heat transfer and precise control of reaction temperatures.
- Conducts reactions continuously without excessive pressure drops.
- Reactants can be proportioned into inlet, or unit can be equipped with multiple injection ports in the turbulent zone.
- Immiscible reactants are maintained in finely dispersed state. Provides maximum contact between reactants.
- Reaction variables controlled automatically, uniformly. Safe, clean operation. Low operating costs. High daily output. Saves floor space.

The GIRDLER Company

A DIVISION OF NATIONAL CYLINDER GAS COMPANY

LOUISVILLE 1, KENTUCKY

VOTATOR DIVISION: New York, Atlanta, Chicago, San Francisco
GAS PROCESSES DIVISION: New York, Tulsa, San Francisco
In Canada: Girdler Corporation of Canada Limited, Toronto

From tires to paint, rubber's strength, elasticity, abrasion resistance, adhesion and other unique properties do the job better and at lowest cost. 50,000,000 gallons of rubber-latex paint sold in 1955 prove the enthusiastic acceptance of its superiority. GEN-FLO 67 will help you cash in on the fast-increasing demand for latex paint. Make *your* latex paint with GEN-FLO and you will add outstanding scrub resistance, cleansability and freeze recoverability. Get a sample of GEN-FLO and prove it for yourself. THE GENERAL TIRE & RUBBER COMPANY, Chemical Division, Akron, Ohio.

Chemical Division GENERAL THE GENERAL TIRE & RUBBER CO. GEN-FLO

Creating Progress Through Chemistry

OPINION

2,000 lbs./day of fission products would be produced.

The numbers you quoted from the National Academy of Science report were the number of gallons of liquid waste that could be accumulated between 1960 and the dates indicated if each ton of natural uranium processed produces 500 gal. of waste and if the fissionable material present in the fuel charge to the power reactor was 10% consumed.

The statement following the numbers quoted overstates the wording of the National Academy's report. Containment of wastes *may* be only an interim answer to the waste disposal problem if containment is regarded as storage in service tanks. However, it is almost certainly true that some form of containment will be necessary for high-level fission products resulting from a nuclear power economy. The problem of storing the volumes of liquids that would be associated with fission product bearing liquid wastes is not an unparalleled problem; in fact, the solution volumes are small, compared with brine disposal in oil fields. However, the hazard associated with the wastes due to their activity and more specifically to the activity of long-lived fission products may be unparalleled in our experience.

FLOYD L. CULLER, JR.
Director Chemical Technology Division
Oak Ridge National Laboratory
Oak Ridge, Tenn.

The point is well taken. It appears that the National Academy of Science report on which CW *reported is less explicit than Reader Culler's summary of the problem.*

SEE YOU THERE

Yale University, International Symposium on Combustion, New Haven, Conn., Aug. 19-24.

University of Pennsylvania, conference on scientific and technical writing, Philadelphia, Aug. 20-24.

National Bureau of Standards, Boulder Laboratories, conference, Boulder, Colorado, Sept. 5-7.

National Agricultural Chemicals Assn., 23rd annual meeting, The Essex and Sussex, Spring Lake, N. J., Sept. 5-7.

American Institute of Chemical Engineers, William Penn Hotel, Pittsburgh, Sept. 9-12.

No matter how you do it, get word to Morton for help in solving any salt problem

The Morton Salt Company offers fast help from salt specialists—at no cost to you. You get the best possible help when we dispatch a Morton Consulting Engineer in your area to your plant. He's an expert when it comes to solving problems relating to salt—and he's backed by the services of chemists and salt scientists at Morton's ultra-modern salt research laboratory.

A Morton Consulting Engineer can help you determine which grade, or grades, of salt will do the best, most economical job in your particular operation. He can help you expand or modernize a brine installation or plan a new water softening system. Best of all, these services don't cost you a cent—and they may well save you hundreds of dollars.

Whatever your salt needs are, Morton can fill them promptly and economically. Morton produces many grades of salt for use by the chemical industry. Only Morton has nine strategically located plants to serve you. And only Morton can offer fast delivery from a bag to a trainload, at favorable prices and freight, *anywhere* in the country.

Sending distress signals from a mountain top is advisable only if you're steeped in the code of the hills. The best way to get help, of course, is to write or wire.

MORTON SALT COMPANY
INDUSTRIAL DIVISION
Dept. CW-8, 120 So. La Salle Street,
Chicago 3, Illinois

Announcing...

PAMAK*

Tall Oil Fatty Acids

Hercules Powder Company announces the availability of Pamak tall oil fatty acids—a major new source of supply for these versatile chemical materials.

Produced in the latest type of multi-column fractional distillation equipment at Hercules' new operation at Franklin, Virginia, Pamak tall oil fatty acids are designed to meet your specific requirements for uniform high quality.

The opportunity to discuss how Hercules may best serve you will be welcomed. For technical specifications and shipping information, write:

**Hercules trademark*

HERCULES

HERCULES POWDER COMPANY
INCORPORATED
992 Market St., Wilmington 99, Del.

PT56-1

CLOTHING BUYER: In Zefran, she has a new synthetic fiber name to learn.

Dow Joins the Fiber Parade

This week, it's official: After five years of research and development (*CW Business Newsletter, Feb. 11; CW, June 2, p. 17*), Dow Chemical is about to join the parade of companies that make synthetic fibers.

It will begin construction (sometime this fall) of a plant to make a "modest" amount—probably 12-14 million lbs./year—of Zefran staple fiber. The plant, which will cost about $15 million, will be located on a 600-acre site on Virginia's James River just downstream from historic Jamestown Island.

Dow has owned the site for about as long as it has been doing research on its fiber.

The plant, to be operated by the newly established Textile Fibers Dept., will receive polymeric raw materials from Dow's Texas Division, which operates two manufacturing complexes near Freeport, Tex. First shipments will be made by rail (the Chesapeake & Ohio will put in a track to the new site), but later shipments may be made by water up the James River.

Why is Dow making a bid now to enter a field in which such firms as Du Pont, Chemstrand, and Carbide and Carbon are already established, and where others such as Tennessee Eastman and Goodrich Chemical should be in volume production ahead of it? Because, like American Cyanamid with its Creslan (*CW Business Newsletter, June 23*), Dow feels its product has a combination of properties not found in other existing fibers.

As President Lee Doan puts it: "We think we have something new and useful to contribute."

Too, though trade sources insist that the Dow fiber is definitely based on acrylonitrile or one of its homologs, the company shies away from calling it an acrylic—reportedly for fear that it will be linked, in textile processors' minds, with Du Pont's Orlon and Chemstrand's Acrilan, which in the past have had dyeing problems. Dow says that Zefran (formerly known as Q-1204) can be dyed as readily as such cellulosic fibers as cotton and rayon.

In addition, the fiber demonstrates the nonwrinkling characteristics of the acrylics and polyesters, has a good initial whiteness, good bleachability, and resists wear, rot and chemicals. Dow reports that Zefran exhibits no serious pilling—pilling, in general, has been a drawback of Dacron—and says it shows little or no tendency to shrink, even in near-boiling water.

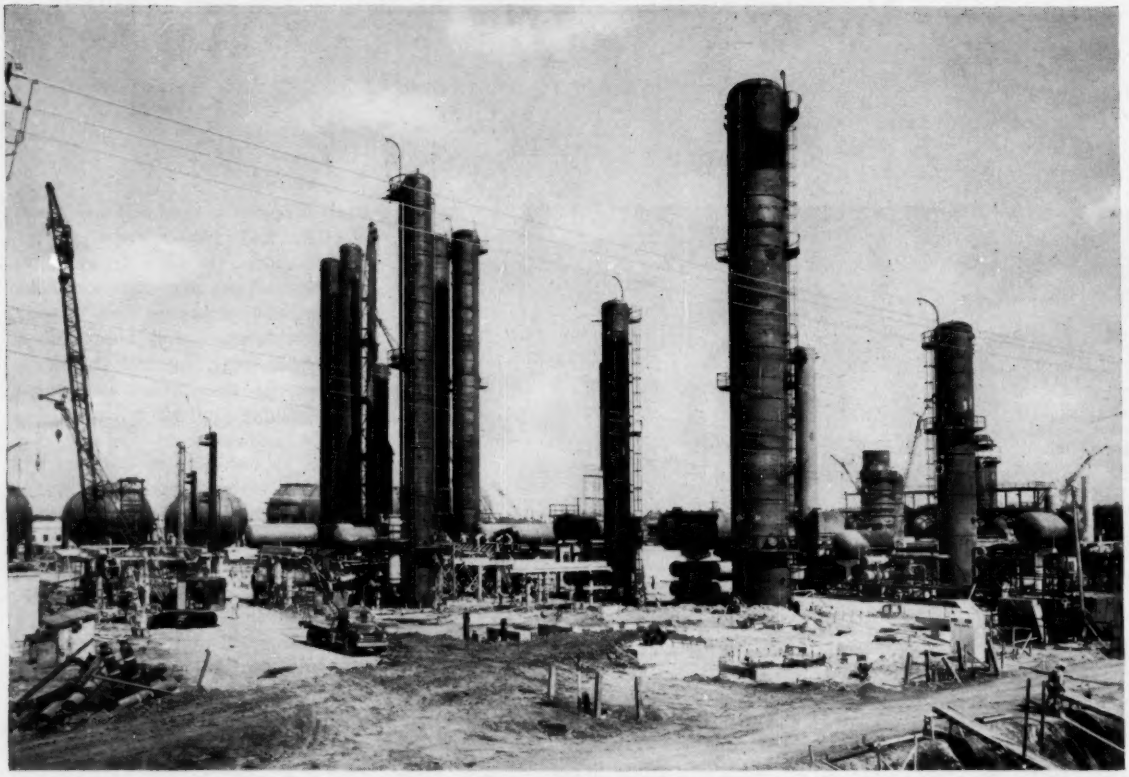
What It Is: Dow describes its fiber as one that combines a highly inert crystalline structure with another structure that has good dye receptivity.

Timetable: Dow hopes to have its plant completed by the spring of '58. It would therefore be in production ahead of American Cyanamid. Though Cyanamid will have limited quantities of Creslan available later this year from a Stamford, Conn., pilot plant, it doesn't plan to start building its 27-million-lbs./year plant at Milton, Fla., until December.

Full-scale marketing of Creslan will start in mid-'58, according to present schedule. But though Cyanamid now reports no change in current plans, some trade sources speculate that Dow's decision may put some pressure on Cyanamid's schedule, especially because of the assumed similarity in the make-up of the two fibers. (Unlike Creslan, however, Dow's fiber reportedly does not use a vinyl or otherwise-substituted pyridine as dye receptor.)

Before either Creslan or Zefran is in full production, Tennessee Eastman will go commercial with Verel. The still-semi-works-scale production of Darlan (by B. F. Goodrich Chemical) may also be scaled up. This fiber, incidentally, is said to be a copolymer of vinylidine cyanide and vinyl acetate.

While Zefran will be the first fiber that Dow itself will merchandise, its jointly owned subsidiary, Saran Yarns, has for some years marketed saran vinylidine chloride-vinyl chloride copolymer yarn primarily for various nonapparel.



CHEMICAL CONSTRUCTION: For companies with plants under construction,* an upward push on costs.

Steel Hikes Bring Chemical Headaches

The steel price hikes, announced last week by major steel producers, will hit chemical manufacturers broadside, both from the equipment quarter and the construction quarter.

Hardly a chemical equipment producer questioned by *CW* felt he could absorb even a part of the $8.50/ton average increase (*CW Business Newsletter, Aug. 11*), since steel costs often account for 30-60% of final product costs. Those who do expect to take some of the shock are primarily custom equipment makers, whose design and fabrication costs outweigh the cost of steel in final price determination.

As to construction costs, chemical companies are resigned to the burden. This year's expansion plans, for which they are already committed, will proceed on schedule, barring serious delays in steel shipments as a result of strike-induced production difficulties. For the most part, companies have long ago lined up their steel supplies and have contracted for them on an "escalator clause" basis. Thus prices will largely be determined by steel price at the time supplies are loaded by producers for shipment.

Working inventories of such materials as steel drums and piping have already felt the impact. Says the director of purchasing at Thompson-Hayward Chemical (Kansas City): "We've already had a 5% increase in the cost of drums, effective immediately, and I expect others." Other companies report that some chemicals in drum quantities went up in price July 1 in anticipation of the steel hike.

How Much? There's no indication that the immediate increases will be the last. In announcing the hikes, U.S. Steel President Clifford Hood deftly pointed out that the price rises reflected, in part, "the initial higher employment costs resulting from the new labor agreement." To most observers, this indicated plenty of leeway for more boosts.

*Pictured, the half-complete Texas Butadiene and Chemical butadiene unit at Channel View, Tex. Large tower weighs 208 tons.

Moreover, other steel producers have voiced their feelings that the increases are too small. Colorado Fuel and Iron Corp. President Alvin Franz says, "We don't feel that the present price increase . . . is adequate to cover wages and other cost increases that will follow as a result of the steel wage increase." Others, including Jones & Laughlin and Pittsburgh Steel, have echoed Franz' sentiments. Reason: growing concern that current depreciation reserves are insufficient to cover much-needed expansion of the steel industry.

Two-Horned Demon: But for the chemical industry, the boosts in raw material costs for chemical equipment producers aren't the only problem. Coupled with them is the fact that many equipment makers are organized by the steelworkers, and thus are faced with higher labor costs as well as higher steel costs. Generally speaking, equipment producers forecast price increases in the range of 8-12%.

Here's how one chemical executive

summed up the question of cost absorption: "How much of the increase will be passed along? Whatever the traffic will bear."

In all events, the consumers will pick up the tab; one manufacturer predicts an 11% cost-of-living increase before the price spiral levels off.

Pointing up the potential immediacy of more increases is the fact that much of the steel inventory laid aside by equipment people was used up during the period of the steel strike. With low stockpiles, and a host of very-short-range commitments, quick price hikes are a matter of necessity.

Expansions Unaffected: Though prices on stainless steel and structural shapes are already up, and equipment costs are rapidly rising, chemical management generally agrees that expansion plans won't change. Says a B. F. Goodrich chemical executive: "An increase of $8.50/ton isn't going to keep us from building a plant if we need it." None of the other companies surveyed report plans for cutting back expansion, or changing specifications for structural materials.

But changing to other materials is on many executives' minds. Chemical makers dependent upon steel for shipping purposes are definitely on the lookout for substitutes. Harshaw Chemical, for example, expects increases in container costs very shortly, is switching to fiber containers where possible, and is searching for other materials to replace steel.

How Long? Answers to the question of when the price picture will clear up are pure speculation. Some equipment businessmen optimistically predict six months; others look to a longer time. If steel prices go up still more, as they seem sure to do, it may be many months before any sort of stability is apparent.

Not all equipment companies have announced immediate increases. Peerless Products, a California equipment maker, is making the decision slowly, says "steel represents a substantial part of the cost of our products; consequently, there will in all probability have to be some price rises after sufficient time to restudy the situation."

Chemical management can certainly expect even higher steel prices. And feelings are strong that with these increased costs, higher chemical prices aren't far off.

Investment Change Ahead

The foreign investment opportunities for U.S. chemical firms may be changed as a result of last week's announcements that:

- The U.S. and Canada have agreed to liberalize tax requirements for American-owned Canadian subsidiaries.
- Imperial Chemical Industries, Ltd., and most other chemical companies in Britain have agreed to freeze their domestic prices until June, 1957.

As a result of the new tax pact, retroactive to the beginning of this year, it is now expected that new opportunities will be opened to Canadians to invest in U.S. chemical companies operating in Canada. The older tax agreement allowed U.S. parent firms a reduced tax totaling 5% on dividends when 5% or less of total stock was Canadian-owned. Under the new pact, Canadian participation can go as high as 49%.

Pressure for some time has been strong in Canada to liberalize the tax convention so that Canadians could participate more freely in the development of their country. The new convention will become effective when the legislatures of both countries have ratified it.

In England, ICI's announcement—which was somewhat qualified—that it would freeze prices and, indirectly, profits on its products came after the Federation of British Industries had seconded a government proposal designed to stem inflation. To the American chemical manufacturers-investors, the question is whether the U.S.-owned companies in Britain would have to go along, too, thus perhaps curtailing profits for American share-owners—and throwing some doubt on the advisability of any future investment there.

Swiss Government Joins in GAF Fight

The government of Switzerland has joined Interhandel, the Swiss-based holding company, in its fight to regain the firm's stock in General Aniline and Film Corp.

In a note delivered to the U.S. State Dept. last Thursday, Switzerland asked joint U.S.-Swiss arbitration of the dispute, which, until its dismissal by Federal Judge Bolitha J. Laws (*CW, Aug. 11, p. 24*), had been pending in the U.S. courts.

The Swiss request asked government-level arbitration under a 1931 treaty signed with the US., which provides for the settlement of certain commercial arguments.

The case had been dismissed, however, because under Switzerland's own laws, Interhandel was unable to produce all the records that Judge Laws considered necessary for the U.S. Justice Dept. to prepare its case. The records, the U.S. felt, were essential in trying to prove that Interhandel, the former I.G. Chemie, was controlled by the German I.G. Farben trust when the U.S. government seized General Aniline.

Upshot of Treaty: Though no final policy decision has yet been made by the State Dept. on the Swiss request, Washington observers consider it likely that the Swiss request will be turned down—ostensibly because Interhandel has further recourse in U.S. courts.

For the present, since Interhandel's case has now been dismissed, government attorneys feel that they are legally free to arrange a sale of the government's stock of General Aniline (*CW Business Newsletter, Aug. 4*). But as a practical matter, it's unlikely that the sale will be held very soon. Physical preparation for the disposal will take some time—and it's possible that even then, Interhandel or some of its or GAF's minority stockholders could get a court order delaying the sale.

Congress may get into the act too. A bill that would have returned to former enemy owners all property seized during World War II, which was unanimously approved by the Senate Judiciary Committee, died from inaction on the Senate floor. It's expected to be reintroduced—and its sponsor, Sen. Olin Johnston (D., S. C.), has "insisted" that no sale be effected before Congress reconvenes in January. Such insistence, however, is likely to be academic. A sale before then is virtually impossible.

EXPANSION

Sulfonates: Chemical Developments of Canada, Ltd. has added facilities at its Longford Mills, Ont., plant to produce alkyl aryl sulfonates, using anhydrous sulfur trioxide.

•

Magnesium Nitrate: J. T. Baker Chemical Co. has boosted its Phillipsburg, N.J., capacity for production of magnesium nitrate.

•

Cement: The Maritime Cement Co., Ltd., is doubling cement output at Havelock, Ont.—from the current 3.2 million bags/year to 6 million.

Silica: Mountain Valley Mining & Coring Co., subsidiary of National Invention Enterprises, is building a silicon dioxide processing plant near Hot Springs, Ark. The plant will process silica sand said to be 99.9% pure.

•

Triacetate Fiber: Celanese Corp. will expand its Arnel synthetic fiber plants at Cumberland, Md., and Rock Hill, S.C. A two-year stand-by bank credit of $35 million has been arranged.

•

Sulfuric Acid: Eastern Mining and Smelting Corp. will build a $30-million mineral refinery, power plant, and sulfuric acid facility in Chicoutimi, Que. The refinery will produce 300 tons of sulfuric acid daily.

•

Uranium: Dawn Mining Co. has awarded a contract to Western Knapp Engineering Co. to build a 400-tons/day uranium ore processing mill at Ford, Wash. Cost: approximately $3 million.

•

Pulp and Paper: Hammermill Paper Co. will spend $4 million in the first year of a four-year expansion of its pulpmaking and finishing facilities at Erie, Pa.

• Tennessee River Pulp and Paper Co. will build a multimillion-dollar kraft pulp and board mill on the Tennessee River near Savannah, Tenn. It is the company's first plant.

•

Elemental Phosphorus: Victor Chemical Works will build an 18,000-tons/year elemental phosphorus furnace at Mount Pleasant, Tenn. The unit's power rating: 35,000 kw.

•

Petrochemicals: Canadian Oil Companies has awarded a $3-million contract to Fluor Corp. of Canada for the construction of a petrochemical plant at Sarnia, Ont.

•

Explosives: Canadian Industries Ltd. has bought land near Seven Islands, Que., as a site for an explosives plant. Production is slated to begin early in 1957.

Worker Peace; Price Increase

LABOR PEACE is returning to the aluminum industry, as it has to the steel industry in past weeks. A further parallel: higher prices for steel (*see p. 30*) and aluminum. The aluminum price increase came soon after the signing of a three-year contract between Reynolds Metals' labor relations director, Frank Weikel (*left*), and the Aluminum Workers' secretary, William Cowley. Also signed: contracts between Alcoa and the Aluminum and Steelworker unions (*see p. 44*).

COMPANIES

General Tire & Rubber Co. is seeking listing on the New York Stock Exchange of 114,717 shares of 5% $100 par preferred stock. At the same time, General is again trying to acquire the assets of the A. M. Byers Co., wrought-iron pipe manufacturer, through a stock trade. General would use Byers' pipe-marketing setup to sell its plastic pipe products.

•

Gulf Oil Corp. acquired over 99% of the capital stock of the Warren Petroleum Corp. through the exchange-of-stock offer it made to Warren stockholders.

•

Glidden Co. has dissolved its subsidiary, E. W. Colledge, G. S. A., Inc., and has brought that firm's activities into its Southern Chemicals Division.

Washington Angles »

» A change in sulfur leasing procedures is ahead. The Interior Dept.'s Bureau of Land Management plans to eliminate the preference rights now given to holders of its oil and gas exploration permits.

Currently, oil and gas lessees can tie down "much more" acreage for a longer time than can sulfur permit holders. If sulfur is discovered in the course of oil drilling, such firms can get sulfur leases without competing for them.

Comments on BLM's proposed new regulations can be made until Sept. 3.

» Are penicillin residues in milk harmful? The Food & Drug Administration has scheduled a meeting for next month to discuss whether consumption of milk with traces of the antibiotic is dangerous either to the general public or to those sensitive to penicillin.

FDA's first two nationwide surveys showed that 6% of the samples contained the antibiotic—in concentrations that ranged up to 0.55 units/ml.

But it isn't likely that FDA will write any new regulations to bar such residues.

» Coal-tar food color safety will also be looked into at an FDA meeting. The agency wants producers and users of FD&C Yellows 1 and 2 to submit pharmacological and toxicological data on them. If the evidence points up questions about safety, they may be removed from the list of colors that may be used in foods, drugs and cosmetics. Three similar materials—FD&C Red 32, Orange 1 and 2—have already been removed from that list.

» A new low-power atomic reactor—possible prototype for a reactor usable for generating the electric power of remote military bases—will be built at the Atomic Energy Commission's test station at Arco, Idaho. Estimated cost: $1,225,000.

Elsewhere, Glidden and General Paint Corp. have dropped negotiations on the sale of the latter's foreign subsidiaries to Glidden. General felt Glidden's proposal wasn't attractive enough.

•

Vanadium Corp. of America will redeem $500,000 of its outstanding 3⅛% convertible subordinated debentures due June 1, 1969. Redemption price is 102½% of principal, plus interest. In addition, negotiations are under way to finance Vanadium's construction program in Jefferson County, Ohio.

•

Assets of the Pittsburgh Metals Purifying Co., maker of exothermic compounds and fluxes, have been purchased by Treesdale Laboratories and Textile Processing, Inc.

•

Gladding, McBean & Co., Provident Securities Co. and Frenchtown Porcelain Co. have jointly formed Thermo Materials, Inc., to develop and produce high-temperature industrial ceramics in California.

•

Pacific Commodities Co., Inc. (Newark, N.J.) has changed its name to Electro Organic Corp.

•

Dow Chemical is offering 150,000 shares of its common stock to its employees and to those of its subsidiaries. The company has also declared a 2% stock dividend—one share for each 50 held.

•

W. R. Grace & Co. has called in for payment all of its $3,988,050 issue of 4¼% convertible subordinate debentures due May 1, 1974, and Nov. 1, 1974. Redemption, on Oct. 1, 1956, would be at 102½% for the former, 103% for the latter.

•

Firth Sterling, Inc., has bought the research and laboratory facilities of the Schwarzkopf Development Corp. Firth plans to expand the facilities.

FOREIGN

Potash/Jordan: The Chemical Construction Corp. has been engaged under the U. S. "Point Four" program to blueprint the reconstruction of Jordan's Dead Sea Potash Works. Chemico will also survey possibilities for the mining of phosphates. On completion of the project, Jordan will be able to export large quantities of potash and phosphates to Asia via Akaba port (Red Sea). The Aman government reportedly has allocated about $11 million to the scheme.

•

Mining/Ethiopia: M. A. Hanna Co. is negotiating for a large mining concession in western Ethiopia near the Sudan border. Hanna is reportedly interested only in such minerals as iron, nickel, manganese, copper, lead, zinc and bauxite, but one company official said there was also a possibility of uncovering rare metals.

•

Paint/Colombia: W. R. Grace and Glidden Co. have just formed a new paint company in Bogota, Colombia. The new company, Pinturas Ico, Limitada, will use the facilities of Flesh & Co., a Colombian paint manufacturing firm just acquired by Grace. Grace holds a two-thirds interest in Pinturas.

•

Fertilizer/Bulgaria: Soviet Russia has agreed to help Bulgaria build a 220,000-tons/year ammonia-saltpeter plant in addition to a 300,000-tons/year superphosphate plant already under construction. The existing "Stalin" combine of Ditrovograd is to be enlarged in 1957-58 to yield at least 220,000 tons/years of nitrogenous fertilizer. Under its current five-year plan, Bulgaria is scheduled to be self-sufficient in artificial fertilizer production by the end of '58.

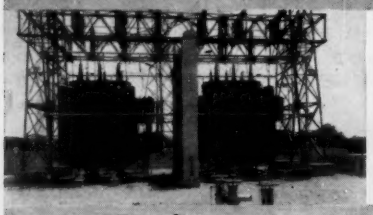
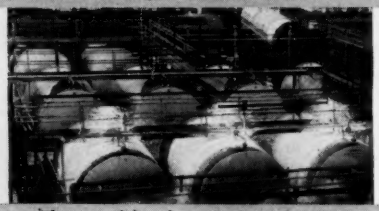
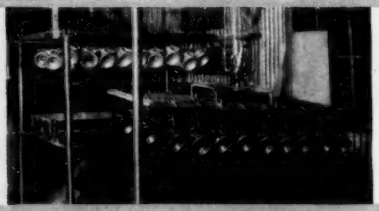
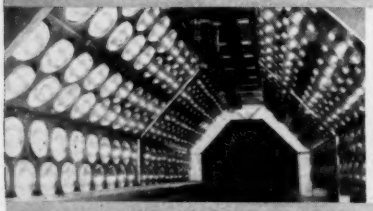
•

Plating Chemicals/England: Harshaw Chemicals Ltd., British subsidiary of Harshaw Chemical, has just started producing several new lines of chemicals. Present plans include new production units for other items manufactured by the parent company as British demands develop.

How many of these SPECIAL FIRE HAZARDS does your plant contain?

Practically every manufacturer has what we call "special fire hazards" — extra hazardous areas in his plant where special protection must be provided to insure against possibly serious loss by fire. Some of these hazards are illustrated below, along with the special fire protection systems recommended to arrest fire without delay. And there are many other hazards, too, where major or minor supplements to ordinary-hazard fire protection systems are a positive "must" — if trouble is to be safely avoided.

Grinnell, with 87 years experience protecting against fire hazards of every description, has a fire protection system for every need. Moreover, the installation of the proper Grinnell System usually serves to reduce fire insurance premiums drastically, often pays for itself in a few years. Check your own hazardous areas against the list that follows:

SPECIAL FIRE HAZARD		RECOMMENDED SYSTEM
 Transformers	Propane tanks	**WATER SPRAY** Grinnell ProtectoSpray; Grinnell Mulsifyre Systems
Bulk oil storage tanks	 Flammable chemicals storage	**FOAM** Grinnell ProtectoFoam System
Engine test cells	 Dip tanks	**CARBON DIOXIDE** Grinnell CO_2 System
 Infrared driers	Flammable liquid pumping stations	**DRY CHEMICALS** Grinnell Dry Chemical System

Call in a Grinnell Fire Protection Engineer. With a full range of equipment, you are assured of unbiased recommendations which will be fitted to your requirements. Grinnell Company, Inc., 288 West Exchange St., Providence, R. I.

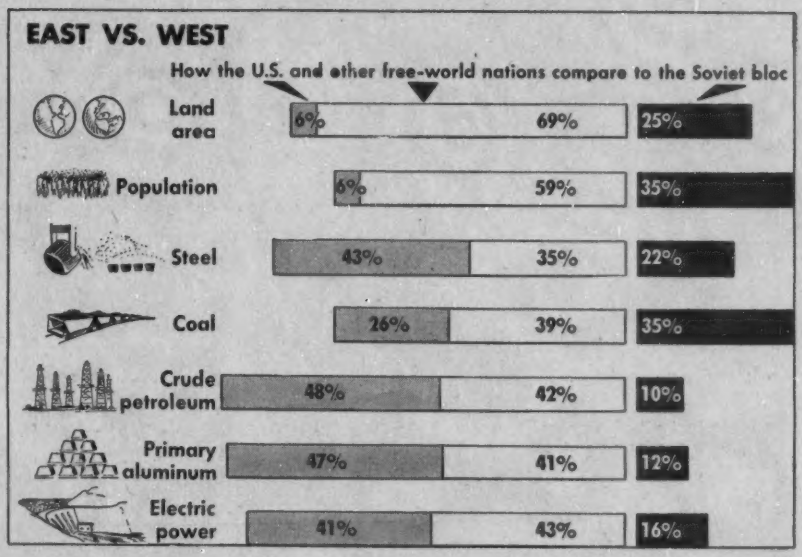
GRINNELL

WHENEVER FIRE PROTECTION IS INVOLVED

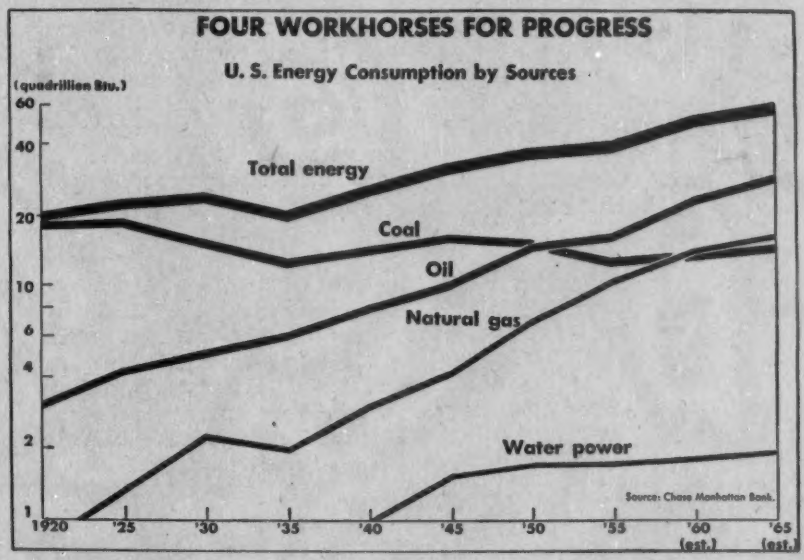
Manufacturing, Engineering, and Installation of Fire Protection Systems since 1870

Charting Business

CHEMICAL WEEK
August 18, 1956



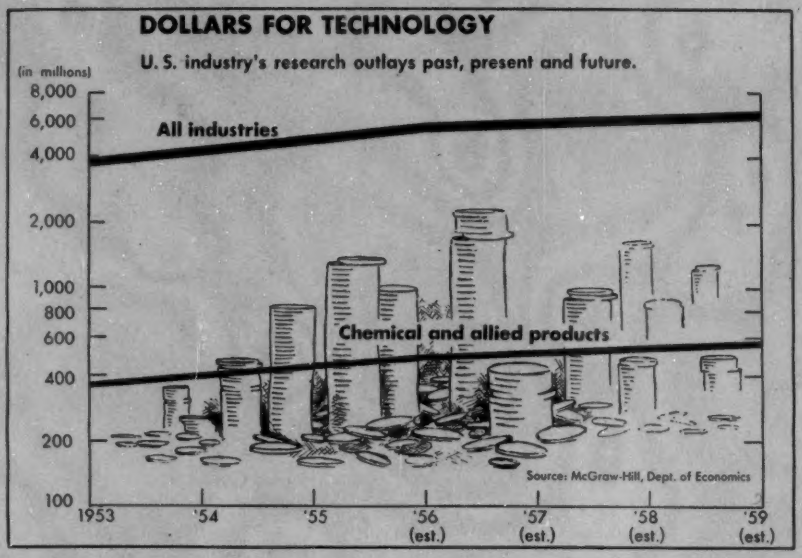
SO MUCH emphasis has been placed recently on the U.S.S.R. outpacing the U.S. in technical manpower (today the two countries have approximately the same number of scientists; by 1960, the U.S.S.R. will be graduating 30,000 more scientists than the U.S.) that it's easy to overlook our own strengths. Example: the U.S., with ¼ the land area and ⅛ the population of Russia and its satellites, outproduces the Iron Curtain countries by nearly 100% in steel, 380% in petroleum, 300% in aluminum, 150% in electrical power.



ENERGY consumption in the U.S. doubled in the last 20 years, appears well on the way to continue its impressive increase—perhaps 50% in the next decade. And coal, buffeted recently by inroads made by newer energy sources (e.g., oil, natural gas), may eventually score a comeback. Reasons: low cost; abundant reserves; improved combustion technology. Indicative of the spiraling demand for new fuels at the expense of coal: within 10 years, gas usage leaped 142%; oil increased 70%; coal consumption declined 25%.

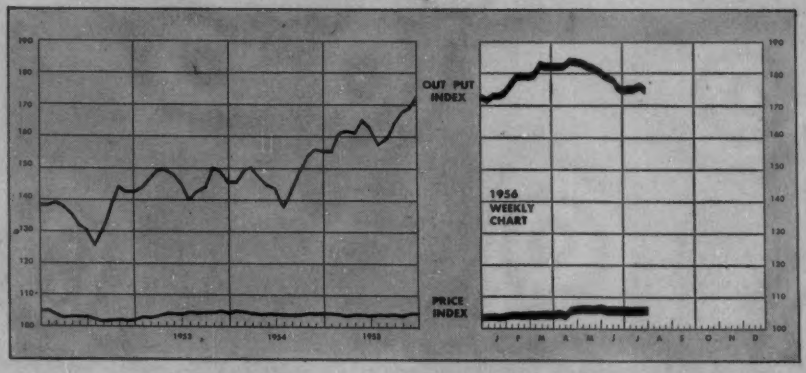
Charting Business

(Continued)



HOW MUCH does the chemical industry spend for research? Latest statistics show that in '55 the chemical industry was one of the leaders in research expenditures. Of some $4.8 billion spent by all industries on research and development last year, chemical and allied products makers accounted for $440 million. Within the next three years, that amount may well increase at least 22%. What does this money buy? Possibly 10,000 new chemicals annually, 400-500 of which are commercially significant products.

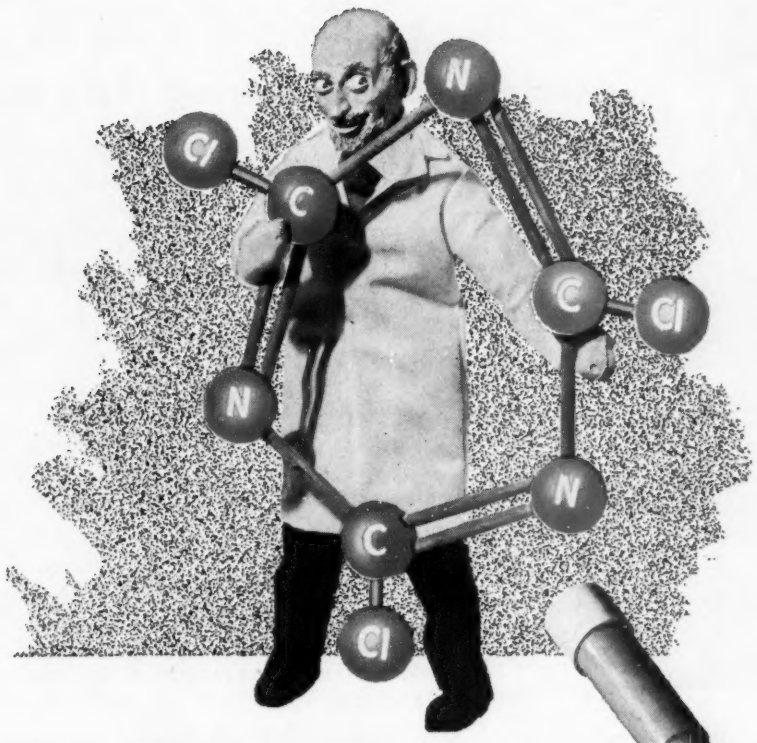
BUSINESS INDICATORS



WEEKLY	Latest Week	Preceding Week	Year Ago
Chemical Week Output Index (1947-49=100)	174.0	174.5	158.0
Chemical Week Wholesale Price Index (1947=100)	105.4	105.4	104.3
Stock Price Index of 11 Chemical Companies (Standard & Poor's Corp.)	490.7	492.0	442.6

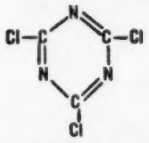
MONTHLY

Foreign Trade (million dollars)	Exports			Imports		
	Latest Month	Preceding Month	Year Ago	Latest Month	Preceding Month	Year Ago
Chemicals, total	106.8	104.8	89.2	22.6	26.6	23.6
Coal-tar products	6.0	5.5	5.6	4.2	5.3	4.1
Industrial chemicals	15.4	15.2	13.1	8.0	7.2	6.7



For versatility in organic syntheses, look at AERO* Cyanuric Chloride!

A wide range of products based on the very stable triazine nucleus can be derived from reactive Cyanuric Chloride. A particularly interesting property of this chemical is that by control of reaction temperatures one can selectively produce mono-, di-, or tri-substituted products. For example:



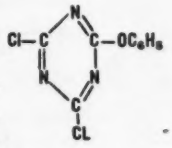
CYANURIC CHLORIDE

Colorless crystals.
M.P. 176° C.
Soluble in acetonitrile, ether, acetone, heptane, carbon tetrachloride and acetic acid.

ESTER DERIVATIVES

C_6H_5OH, NaOH

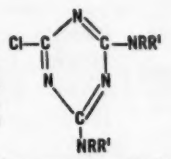
Monosubstitution at 0-5° C. (Shown)
Disubstitution at 15-20° C.
Trisubstitution at 30-40° C.



AMINO DERIVATIVES

RR'NH

Monosubstitution at 0° C.
Disubstitution at 30-50° C.
(Shown) Trisubstitution at 90-100° C.



Temperatures shown are for typical radicals. Partial substitution products may be further reacted with other radicals allowing great versatility in synthesis.

*Trademark

These are two of many molecule-building reactions that are possible. Cyanuric chloride may be considered the nitrogen analog of acid chlorides, and will react similarly. Detailed information on reactions of cyanuric chloride is offered by Cyanamid in our brochure, "Cyanuric Chloride Derivatives." Why not investigate the possibilities of triazine chemistry in your own synthesis problems?

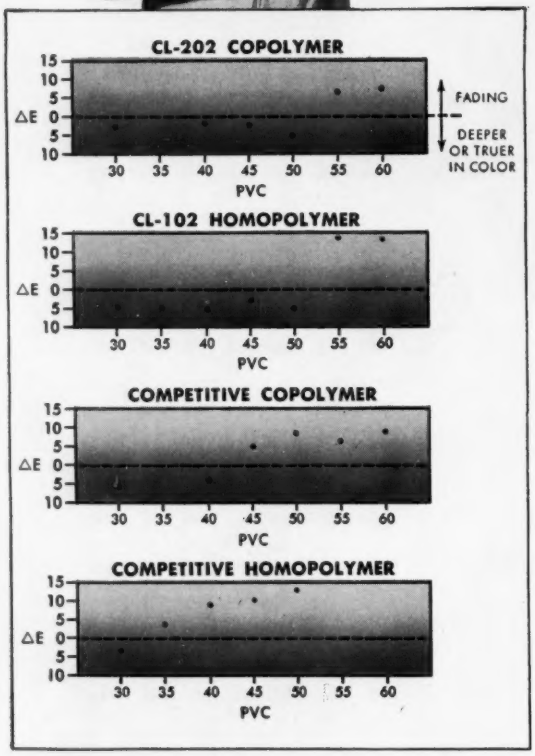
CYANAMID

AMERICAN CYANAMID COMPANY
MANUFACTURERS CHEMICALS DEPARTMENT
30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

In Canada: North American Cyanamid Limited, Toronto and Montreal

accelerated weathering tests prove:

CELANESE PVAc EMULSIONS GIVE YOU SUPERIOR TINT RETENTION



EXTERIOR DURABILITY. The above diagram illustrates the variations in tint retention obtained on identical paints formulated with fine vs. coarser particle size emulsions. These test paints, ranging in PVC from 30-60%, were made from a master pigment paste dispersion and let back with the test emulsions. The finished paints were tinted to a medium blue with an aqueous phthalocyanine blue dispersion and applied over asbestos cement panels. After Weatherometer exposure, the tri-stimulus value ΔE was plotted for each PVC. The value ΔE is the closest numerical representation of the color change apparent to the eye.

A study of the charts shows that *fine particle size* emulsions can be formulated at higher PVC's without sacrificing tint retention. The Critical PVC of both Celanese PVAc emulsions was greater than 50% . . . *higher than any emulsion tested!*

Fine particle size is the key to the superior tint retention of exterior polyvinyl acetate paints based on Celanese Homopolymer and Copolymer emulsions!

These facts were borne out in Weatherometer Tests on exterior PVAc paints ranging in PVC from 30-60%. All paints were identical in formulation except for the emulsion used.

Fading at low PVC's occurred in those paints formulated with ordinary *coarser particle size* emulsions after as little as 600 hours Weatherometer exposure. These same paints formulated with Celanese *uniformly fine particle size* emulsions showed *no evidence of fading* at PVC's up to 50%.

Tint retention and high pigment binding are just two reasons why Celanese CL-102 Homopolymer and CL-202 Copolymer emulsions are your best buy in formulating quality, low-cost vinyl paints. Just check these facts about Celanese PVAc emulsions:

- **Can be formulated at PVC's approaching those of alkyd flats**
- **Extremely fine particle size**
- **Crystal-clear, water-resistant films**
- **Superior freeze-thaw stability**
- **Tough, flexible, weather-resistant films**
- **Superior low-temperature film coalescence—even below 40° F.**
- **Excellent mechanical stability; can even be milled**
- **Superior wetting ability—an extra margin of safety against flocculation difficulties**

A Celanese technical representative will be happy to discuss these characteristics with you and assist in your formulations. Send for our brochure containing technical bulletins on the new homopolymer CL-102 and Celanese copolymer emulsion CL-202. Along with it you'll receive a manual of standard laboratory tests by which you can determine the properties of any resin emulsion vehicle. Just fill out and mail coupon below.

Celanese Corporation of America, Plastics Division,
Box 163-H. 290 Ferry Street, Newark 5, New Jersey

☐ Please send me brochure on Celanese PVAc paint emulsions CL-102 and CL-202, including test manual.

Please send me samples of:
☐ CL-102 Celanese Homopolymer PVAc emulsion.
☐ CL-202 Celanese Copolymer PVAc emulsion.

NAME_____

TITLE_____ COMPANY_____

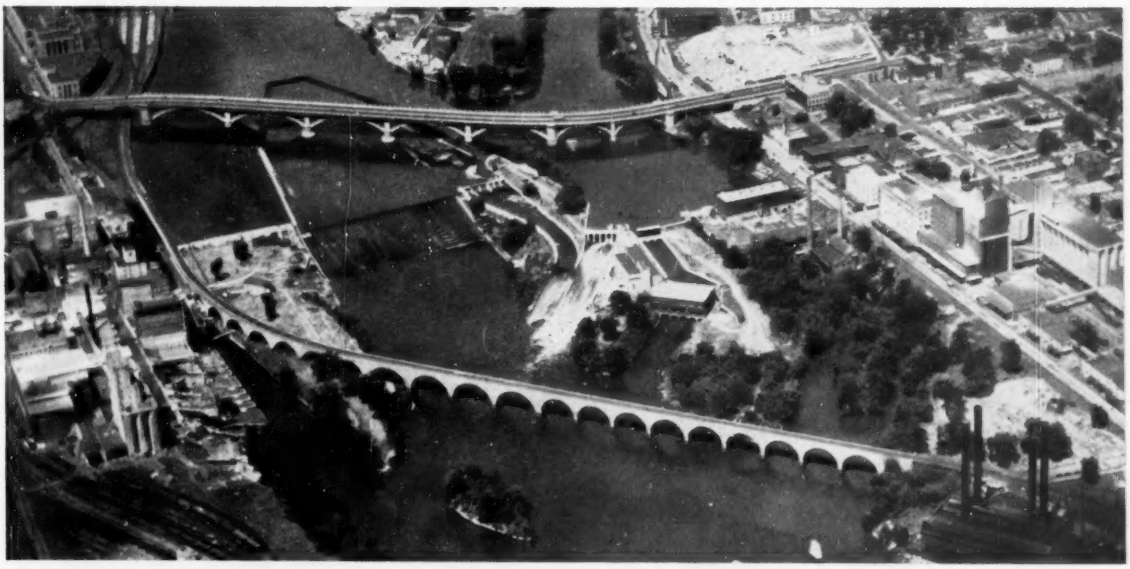
ADDRESS_____

CITY_____ ZONE_____ STATE_____

Celanese

plastics and resins

Celanese®



MINNESOTA'S TWIN CITIES: Still rivals, but sharing an industrial future.

MARK HURD MAPPING COMPANY

MINNEAPOLIS: To flour-milling, add specialty chemicals.

RIEHLE STUDIOS, ST. PAUL

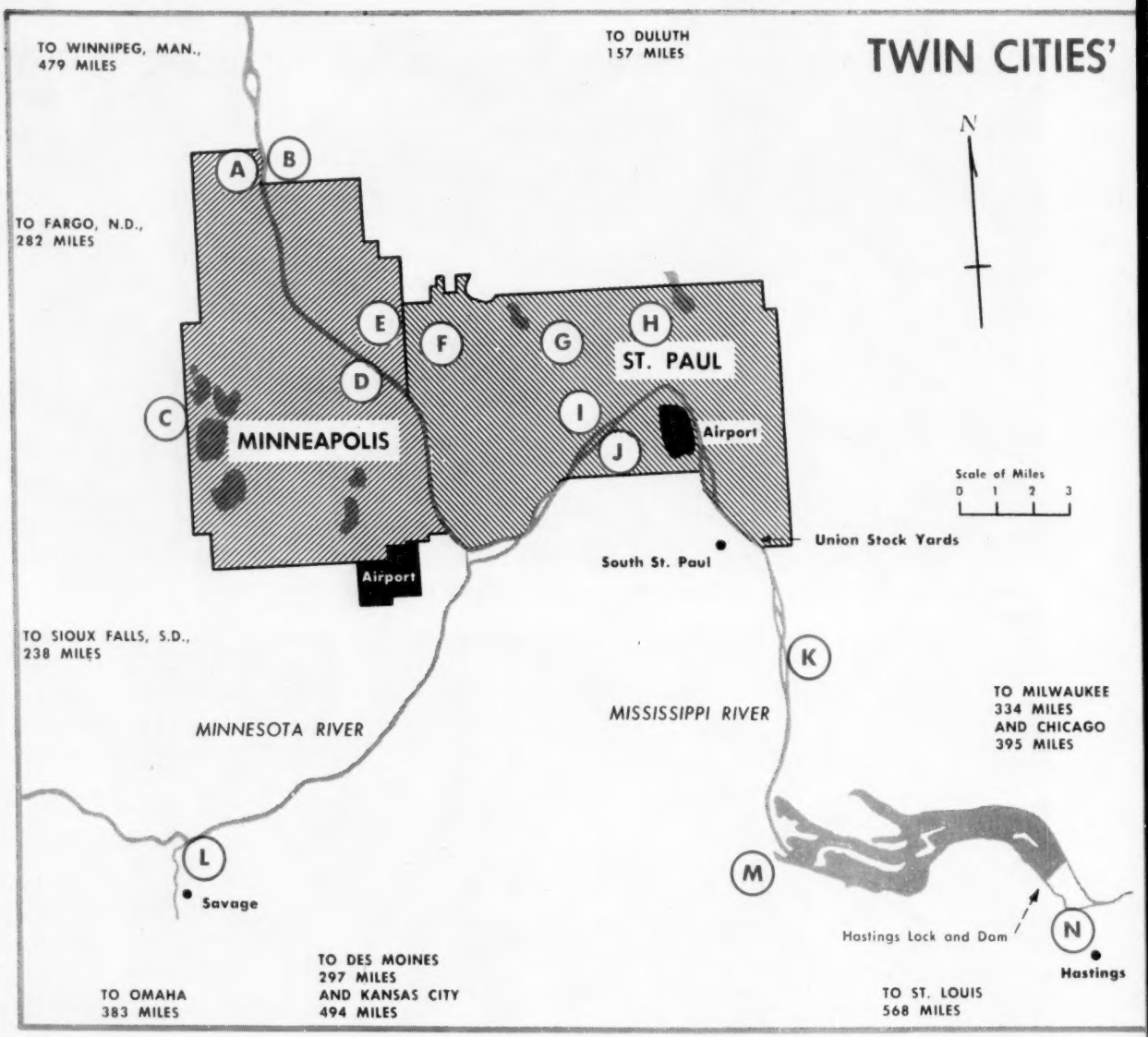
ST. PAUL: Will industrial chemicals eclipse meat-packing?

Mining Keys Twin Cities' Chemical Future

They're still rivals, and they're far from being identical twins, but Minneapolis and St. Paul—the "Twin Cities" through which funnel hugh quantities of grain, oil and other prairie products bound for Eastern and Southeastern markets and seaports—now see that they have one thing in common: a future of industrialization that has an increasingly important chemical component.

Until recently, aside from the big flour mills, there's been relatively little manufacturing industry in the Twin Cities despite the fact that on at least two counts they're emphatically well qualified for plant locations: they have great quantities of cool, high-quality, low-cost water available for industrial use; and they have good transportation facilities, including barge lines on the Mississippi River, 9 trunk railroads and 37 truck terminals used by more than 100 motor freight carriers. But two other essentials—a mass market and basic raw materials—just haven't been close enough.

Now, however, this situation is changing. Three major markets—agricultural, industrial and consumer—are growing steadily in the upper Midwest; and discovery of more raw



materials and new processes has been turning up new chemical opportunities—though not just within the two cities themselves. While the area's timber and high-grade iron ore have dipped in relative importance in the national economy, its wheat and other farm products are holding their traditional high ranking; and in addition, a number of mineral products are attracting industry's investments and investigations: petroleum and natural gas, lignite, salt, sodium sulfate, clay, manganese, titanium, copper, nickel, alumina and pyrites—all found in the three-state area of Minnesota, North and South Dakota.

Chemical Expansion: Although most of these newer (to this region's economy) materials come from outlying areas, new processing plants have sprung up mainly in the Twin Cities, which comprise the area's transportation and financial center and its largest local market. And expansion of chemical process industries in Minneapolis and St. Paul is going on at a rapid rate:

- Archer-Daniels-Midland is building a $1-million addition to its facilities for handling grain, soybeans and their products.
- Great Northern Oil Co. is completing a $25-million oil refinery (25,000 bbls./day), which also produces sulfur (66 tons/day) for the paper industry; Northwest Refining Co. is adding a polymerization unit to increase capacity to 30,000 bbls./day, is planning a $5-million catalytic reformer.
- St. Paul Ammonia Products expects to be onstream early next year with a $16-million ammonia plant (200 tons/day).
- Minnesota Mining & Mfg. has spent $15 million locally in expansion during past 10 years, is currently adding a $3-million facility to its central research laboratories.
- Minnesota Farm Bureau Service

CHEMICAL PROCESS ROSTER

(Major chemical process plants in Minneapolis, St. Paul and vicinity)

LOCATION	COMPANY	PRINCIPAL PRODUCTS
A	Minnesota Linseed Oil Co.	Vegetable oils
B	Cargill, Inc.	Vegetable oils
C	Koppers Co.	Coal chemicals
	Lithium Corp. of America	Lithium and compounds
D	Durkee-Atwood Co.	Specialty chemicals
	Frost Paint & Oil Corp.	Paints
	Fuller Pharmaceutical Co.	Pharmaceuticals
	General Mills, Inc.	Vegetable oils
	Interchemical Corp.	Inks
	Minnesota Chemical Co.	Soaps
	Minnesota Paints, Inc.	Paints, varnishes
	Minnichlor, Inc.	Chlorophyll
	Purity Soap & Chemical Co.	Soaps
	Stewart Paint Mfg. Co.	Paints
E	Air Reduction Sales Co.	Industrial gases
	Archer-Daniels-Midland Co.	Fatty acids, linseed oil
	Liquid Carbonic Corp.	Industrial gases
	McLaughlin-Gormley-King Co.	Insecticides
	Spencer Kellogg & Sons, Inc.	Vegetable oils
F	Pure Carbonic Corp.	Industrial gases
	Reilly Tar & Chemical Corp.	Tars
	Speed-O-Laq Products Co., Inc.	Paints, varnishes
G	Liquid Carbonic Corp.	Industrial gases
H	Minnesota Mining & Mfg. Co.	Abrasives, tapes, reinforced plastics
I	Hilex Co.	Sodium hypochlorite
	Locto Co.	Synthetic resins, medicinal chemicals
	Minnesota Farm Bureau Service Co.	Fertilizers
	Raymond Laboratories, Inc.	Specialty chemicals
	W. H. Sweeney & Co.	Paints, varnishes
J	H. B. Fuller Co.	Industrial adhesives
K	Northwestern Refining Co.	Petroleum products
L	Cargill, Inc.	Vegetable oils
M	Great Northern Oil Co.	Sulfur, petroleum products
	St. Paul Ammonia Products, Inc.	Ammonia
N	Minnesota Mining & Mfg. Co.	Fluorochemicals, resins, adhesives

Co. is just onstream with a fertilizer plant.

• Rayette, Inc. (Raymond Laboratories) is building plants to make potassium bromate, thioglycolic acid and sodium lauryl sulfate; it's also putting up a new warehouse.

Chemical Service Center: Big new primary production projects at various points in Minnesota, North and South Dakota are already started or seem sure to come; and it's likely that companies in the Twin Cities will supply many of the chemicals needed for those operations. A number of major chemical concerns are setting up permanent branch offices in Minneapolis and St. Paul, and at least one of these new branches is overstaffed—for the stated reason that much greater business is expected in this area.

In Minnesota's northeast corner, beyond the famed Mesabi (iron ore) Range, three big firms are building new facilities and increasing present capacity to produce iron pellets from taconite rock, a relatively low-grade ore. In the famed Williston Basin (mostly in western North Dakota), petroleum production and refining is rising each year, and the record volume of wildcat drilling activity this year indicates that the oil and gas boom there hasn't reached its peak yet. There are 400 producing wells; daily output may be 250,000 bbls. by '60.

Lignite—of which North Dakota has an estimated 600 billion tons—has considerable potential importance, both as a fuel and as a source of organic chemicals (*CW, Nov. 19, '55, p. 92*). Work on uranium extraction is under way in the western hills of the Dakotas; and a manganese plant went into operation late last year in northern Minnesota. Other companies are exploring for commercial-size nickel and gypsum deposits, and several aluminum companies are said to have a twofold interest in North Dakota: first, the possibility that a reduction plant could be based on lignite as a fuel to furnish cheap thermal electric power; second, the chance that an economic process might be found to get alumina out of the state's anorthosite rocks.

More Power Coming: When the U.S. Bureau of Reclamation and the Army's Corps of Engineers complete their Missouri River program in a few years, there'll be nine hydroelectric plants in the Dakotas, with total installed capacity of 1,654,200 kw.—more than that of the Bonneville and McNary dams together. In Minnesota, Northern States Power Co. has spent $335 million on expansion since World War II and plans an additional $178-million investment in generating and transmission facilities over the next four years.

A regional resources survey (by Arthur D. Little, Inc.) suggests the economic feasibility of an aluminum smelter, a steel mill in the Dakotas, an ammonia plant, a chlor-alkali plant. Sulfuric acid (available from native pyrrhotite and pyrite) will be needed for refineries and fertilizer plants, and tremendous quantities of oxygen will be needed for jet-flame mining. Salt is available from solid deposits and oil well brine; a salt cake plant is regarded as practical; and there's a chance that ethylene and possibly other petrochemical plants might come later.

Distances from principal U.S. markets and from the Great Lakes-St. Lawrence waterway will probably deter the Twin Cities from becoming a major chemical industry center. But all indications are that they'll cop a hefty share of the industry's over-all expansion during the next four years.

CHEMICAL LABOR CONVENTIONS—1956

Who	When	Where	What they'll take up
Oil, Chemical & Atomic Workers (AFL-CIO)	Aug. 20-24	St. Louis	1. Method of electing officers 2. District reorganization 3. Repeal of T-H and right-to-work laws 4. Dues hike 5. Biennial conventions 6. Multiplant bargaining 7. Merger with ICWU
District 50, United Mine Workers (delegates attend as observers to UMW convention)	Oct. 2-10	Cincinnati	1. Repeal of T-H and right-to-work laws 2. Merger with AFL-CIO
International Chemical Workers Union (AFL-CIO)	Oct. 1-5	Buffalo	1. Election of officers 2. Multiplant bargaining 3. General bargaining goals 4. Merger with OCAW

Convention Time for Unions

This is convention year, and chemical workers have scheduled their share with a full round of meetings slated to run well into the fall (see table).

Of primary interest to chemical management will be the conventions of OCAW and ICWU—the two top bargaining groups in the industry.

Few Contested Elections: It's possible that the re-election of some ICWU officers will be contested. Grounds for complaint will include such charges as too much power for the executive board in violation of the local autonomy principle, and too much pressure, or the lack of it, by some officers for this union's proposed merger with OCAW.

ICWU President Edward R. Moffett's regime may also come under fire from charges of favoritism in aiding some locals and not others. Much of this bombardment can be expected from Northeastern locals — some of which have been dissatisfied since their candidate, then-President H. A. Bradley, was ousted in the bitter '54 elections.

No Upset Foreseen: OCAW President O. A. Knight's re-election is considered a certainty. He's been in office since 1940.

Neither OCAW nor ICWU is expected to make a definite merger decision this year, but both will likely strengthen multiplant bargaining councils—some of which have been operating jointly—and authorize these councils to start working toward company-wide or sub-industry-wide contracts. In addition, both groups are concerned with displacement of chemical employees through continuing automation.

The issues are "hot" in many instances, and the discussions and decisions may tip off these unions' future bargaining and organizing moves.

LEGAL

Annual Pipeline Fees: Representatives of West Virginia chemical, oil and natural gas industries have rallied in protest over the state's proposed annual fee on pipelines and submarine cables crossing navigable rivers.

The representatives—including former Gov. Homer Holt representing Union Carbide and Carbon (New York)—have opposed the fees on the grounds that firms do not make annual payments to property owners along pipeline and cable right of ways. They maintain that rights for crossing navigable streams should correspond—in nature and financial outlays—to those for crossing privately owned property.

It's estimated that the 671 pipelines and 50 cables crossing navigable streams in the state would bring in an annual revenue of approximately $45,000.

•

Chemical Center: An agreement between railroads serving the Port of Houston, Tex., to jointly serve the proposed $1-million Phillips Chemical Center near San Jacinto has cleared the way for further development. Port Terminal Railroad Assn. and Southern Pacific Lines—which originally claimed exclusive rights to serve the center—reached an out-of-court agreement after suit had been filed against SP.

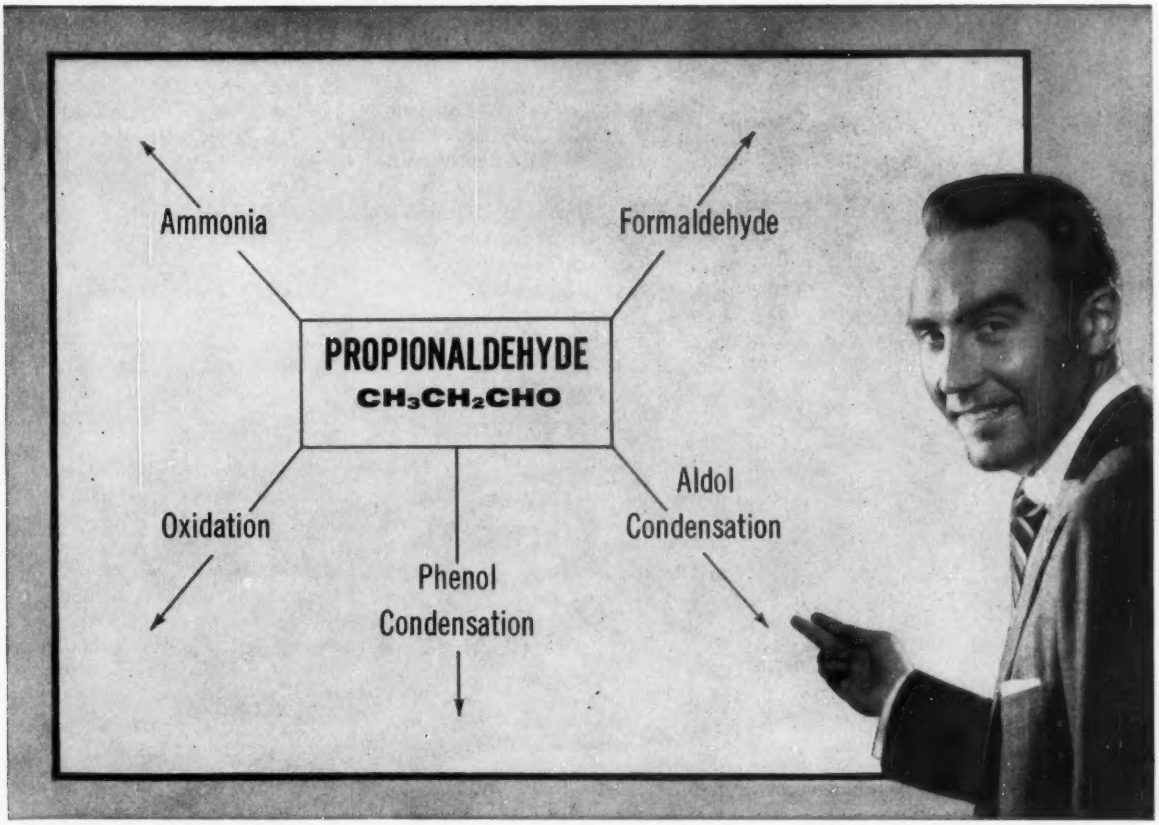
Celanese Corp. (New York) and M. W. Kellogg Co. (New York) have announced plans to build multimillion-dollar polyethylene plants in the 950-acre project. The expanded Phillips refinery at Sweeny is expected to provide enough ethylene for these and other plants in the center.

•

Lead Poisoning: Two Salisbury, N.C., painters have filed actions in state superior court for lead poisoning allegedly contracted from a product not labeled poison.

W. R. Roseman and Williams B. Redwine are asking a total of $80,931 from Yoder and Gordon Co., Inc. (Norfolk, Va.), charging that a quantity of a poisonous lead compound (litharge) purchased from the company was not labeled poison—as required by North Carolina state law—and that they subsequently contracted lead poisoning from the product.

A superior court jury in Salisbury recently awarded $18,000 in a similar action.



Propionaldehyde can help you develop new and improved products

(Now available in tank car quantities)

CARBIDE
AND CARBON
CHEMICALS

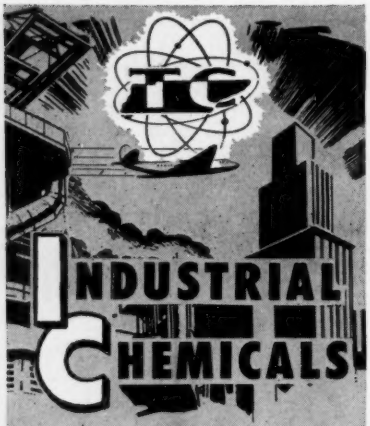
Carbide and Carbon Chemicals Company
A Division of
Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.

Propionaldehyde offers you a versatile and economical route to new and better products for industry. A product of CARBIDE's new oxo unit at Texas City, Texas, it is produced with consistently high quality.

These reaction products of propionaldehyde have already reached commercial importance—trimethylol ethane for alkyd and polyester resins; 2-methyl-1-pentanol for plasticizers; propionic acid for esters, salts, and cellulose ester molding powders; and propyl amines as rubber accelerators.

Other derivatives of propionaldehyde are intermediates for the manufacture of pharmaceuticals and lubricant additives.

Call or write now for a sample and complete information on propionaldehyde. In Canada: Carbide Chemicals Company, Division of Union Carbide Canada Limited, Montreal.



We mine Copper, Iron, Zinc and Sulfur and are basic producers of their chemical derivatives. Our technical know-how in these basic materials is your assurance of exacting quality control and strict uniform consistency.

- **COPPER SULFATE**
  Industrial Crystals and all common grades.
- **MONOHYDRATED COPPER SULFATE**
  35% Copper as metallic packaged in steel drums at no extra cost.
- **COPPER CARBONATE**
  55% Copper as metallic. Light and dense grades.
- **CUPRIC CHLORIDE**
  37% Copper as metallic. Available in poly-lined drums or bags.
- **CUPRIC OXIDE**
  Minimum 76½% Copper as metallic. Technical grade . . . NOT A BY-PRODUCT.
- **MANGANESE SULFATE**
  65% Mn SO_4. Designed specifically for inclusion in mixed fertilizer.
- **MONOHYDRATED MANGANESE SULFATE**
  93% Mn SO_4, H_2O. Highest purity, technical grade . . . NOT A BY-PRODUCT.
- **FERRIC SULFATE**
  Partially hydrated, free flowing granular form. Available in bags or bulk.
- **LIQUID SULFUR DIOXIDE**
  Highest commercial quality, available in tank cars, tank wagons, ton cylinders and 150-lb. cylinders.
- **MONOHYDRATED ZINC SULFATE**
  36% Zinc as metallic. For agriculture and industry.
- **CHLOROSULFONIC ACID**
  Iron less than 1.0 ppm as loaded. Water white. Delivered in glass-lined tank wagons, also in stainless steel drums.
- **MANGANOUS OXIDE**
  Minimum 48% Manganese as metallic. Feeds, fertilizers, spray or dust grades.
- **PARA TOLUENE SULFONIC ACID, ANHYDROUS**
  Other organic Sulfonic Acids.

Samples, specifications and detailed information available upon request.

TC

TENNESSEE CORPORATION
617-629 Grant Building, Atlanta, Ga.

ADMINISTRATION

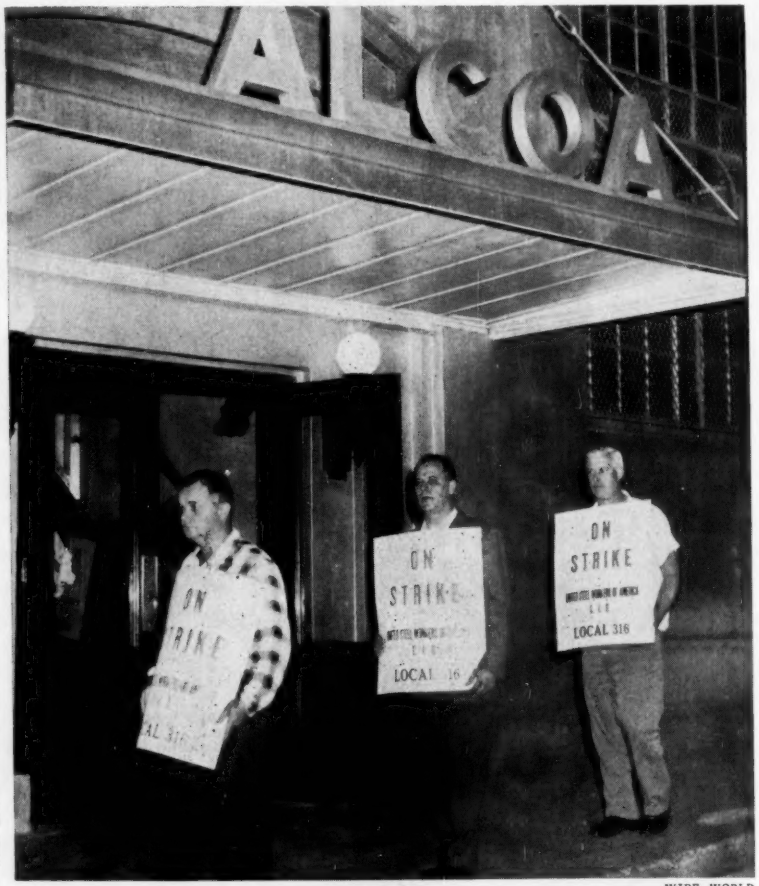
LABOR

Wholesale Bargaining: The swing toward long-term labor contracts in chemical process industries seems to be nearing the halfway mark; and the possible trend toward multiplant bargaining may be getting up enough steam for a faster pace in '57.

Most important recent signings—on both counts—were new three-year contracts between Aluminum Co. of America and its two major unions: Aluminum Workers International Union (AFL-CIO) and United Steelworkers of America (AFL-CIO) covering 15,000 workers in nine plants and 18,000 workers, respectively; and between Reynolds Metals Co. and AWIU covering about 14,000 workers. Also significant: these settlements represent another advance for the "supplemental unemployment benefits" (SUB) idea, which has moved into three new industries in as many weeks—rubber, steel, and now aluminum. As of last week, United Steelworkers was still on strike against Reynolds, was negotiating with Kaiser Aluminum & Chemical.

That the longer-term contracts are now in the ascendancy in the chemical industry is indicated in a U.S. Dept. of Labor report out last week. Of 49 contracts covering 1,000 or more employees each in effect this past spring in plants producing chemicals and allied products, only 10 were to run for one year or less. Twenty-one were for two years' duration, and two had a five-year life.

At Buffalo, N.Y., two new contracts will each run two years. Durez Plastics Division of Hooker Electrochemical is granting a 14¢/hour general wage increase and other benefits worth 4¢/hour; and Semet-Solvay Division of Allied Chemical & Dye is boosting wage rates by 6% this year and an additional 3% next year.



WIDE WORLD

ALUMINUM STRIKERS: In multiplant bargaining, a new advance for SUB.

WSW 5927

Soft to touch—and beautiful, too

NO wonder our young lady is satisfied to just curl up and enjoy herself before taking to the road in her new convertible. It's the first time she's ever rubbed cheeks with soft, comfortable vinyl upholstery . . . and she *likes* it!

As the mileage builds up, she'll discover some other very pleasant facts about vinyl: Its durability is amazing . . . it outwears all other upholstery materials. It won't fade, crack or peel. And a pass of a damp cloth keeps it spotless.

But her big blue eyes will really pop when she discovers how soft and supple it stays, right around the calendar. And for that, she can say thanks to *plasticizers*, the flexibility ingredients in vinyl plastics.

We mention plasticizers because they're one of the many coal-derived chemical products we make for industry. While their principal role is keeping plastic products like upholstery, garden hose and vinyl floor tile flexible under all conditions, certain plasticizers also impart such special properties as resistance to heat, sunlight and oil in finished plastic products.

To meet these diverse needs, Pittsburgh produces one of industry's most complete families of vinyl plasticizers—*Pittsburgh PX Plasticizers.* And our research laboratories are constantly at work developing new and better plasticizers . . . and application practices that are more efficient and economical.

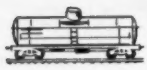
If your company uses plasticizers—or any other coal-derived industrial chemicals—let us acquaint you with the unique advantages of buying from Pittsburgh, *a basic and integrated producer.*

PITTSBURGH COKE & CHEMICAL CO.

COAL CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON

ROHM & HAAS ALKYLPHENOLS

Low Cost Intermediates



Here are just a few ideas on how Rohm & Haas octylphenol and nonylphenol can help you build products and properties economically. • They react with aldehydes to yield phenolic resins. • When used with other phenols, even small quantities make phenolic resins more water resistant, more soluble in oil, and better in electrical properties. • Octylphenol stabilizes ethylcellulose against deterioration by ultraviolet light.

These alkylphenols are also logical intermediates in making non-ionic wetting agents and emulsifiers, detergent oil-additives, fungicides, rubber chemicals, corrosion inhibitors, and pharmaceuticals. They're available in tank cars and carloads. Write Department SP today for more information.

Chemicals for Industry

ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

Representatives in principal foreign countries

ADMINISTRATION

KEY CHANGES

James M. Cotter, to vice-president, Ohio Chemical & Surgical Equipment Co. (Madison, Wis.), division of Air Reduction (New York).

Manuel N. Fineman, to technical director, Puritan Chemical Co. (St. Louis).

Stuart K. Hensley, to executive vice-president, Toni Division (Chicago), Gillette (Boston).

William F. Waldeck, to technical director, Shea Chemical Corp. (Baltimore).

D. Woodson Ramsey, Jr., to director, Esso Research and Engineering Co. (New York).

Herbert H. Bunchman, to secretary and treasurer, Plough, Inc. (Memphis, Tenn.).

James A. Bralley, to director of research, A. E. Staley Mfg. Co. (Decatur, Ill.).

Herbert R. Helbig, to vice-president, export department, Reichhold Chemicals (White Plains, N.Y.).

William P. Senett, to director, laboratory research department, Walter Kidde Nuclear Laboratories, Inc. (Garden City, N.Y.).

Earl C. Lenz, Sam Schuller, Samuel J. Lowenstein and **Thomas Wood Morningstar,** to directors; **Laurent J. LaBrie,** to vice-president in charge of technical coordination; and **Edwin M. Hillary,** to vice-president in charge of production; Morningstar, Nicol, Inc. (New York).

Earl A. Hensal, to vice-president in charge of production, Seiberling Rubber Co. (Akron, O.).

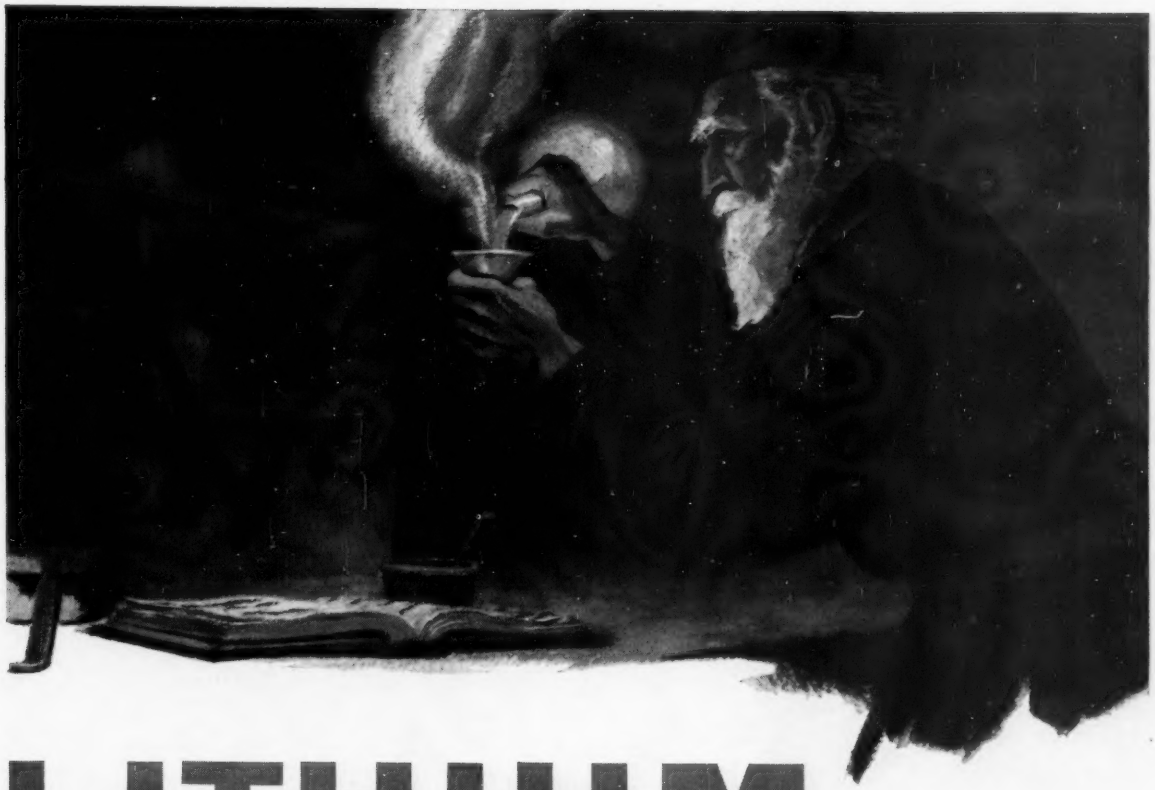
D. I. Weisblat, to director of chemical research, Upjohn Co. (Kalamazoo, Mich.).

Burton R. Buck, to vice-president, Electro Metallurgical Co., division of Union Carbide and Carbon (New York).

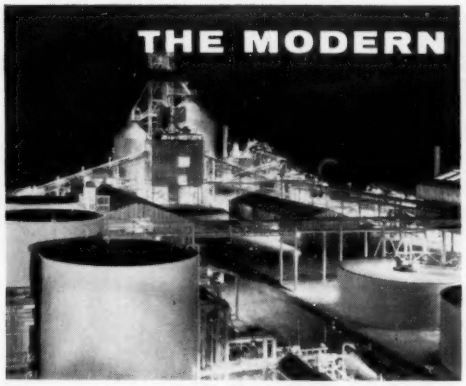
Thomas Skeuse, to director of operations, Dixon Chemical & Research, Inc. (Newark).

RETIRED

William B. Plummer, president, Indoil Chemical Co. (Chicago).



LITHIUM



San Antonio, Texas plant of American Lithium Chemicals, Inc., processing lepidolite ore into lithium hydroxide and other chemicals.

ALCHEMIST *changes things for the better!*

Every day, through modern chemistry, the addition of lithium is changing products for the better. In many areas — notably in glass, ceramics, multi-purpose greases, alkaline storage batteries, air conditioning and heat treating — lithium is reaching out with its magic touch to add superiority to the product or improvement to the process. American Potash & Chemical Corporation is a leading producer of lithium in many forms. Its Trona and Los Angeles, California plants produce lithium carbonate, lithium chloride and lithium bromide. AP&CC's subsidiary, American Lithium Chemicals, Inc., at San Antonio, Texas, makes lithium hydroxide from high-grade lepidolite ore. We suggest you take a good look at the versatile properties of lithium... and in so doing, remember Trona® lithium products are backed by years of pioneering experience and extensive production facilities.

American Potash & Chemical Corporation

TRONA

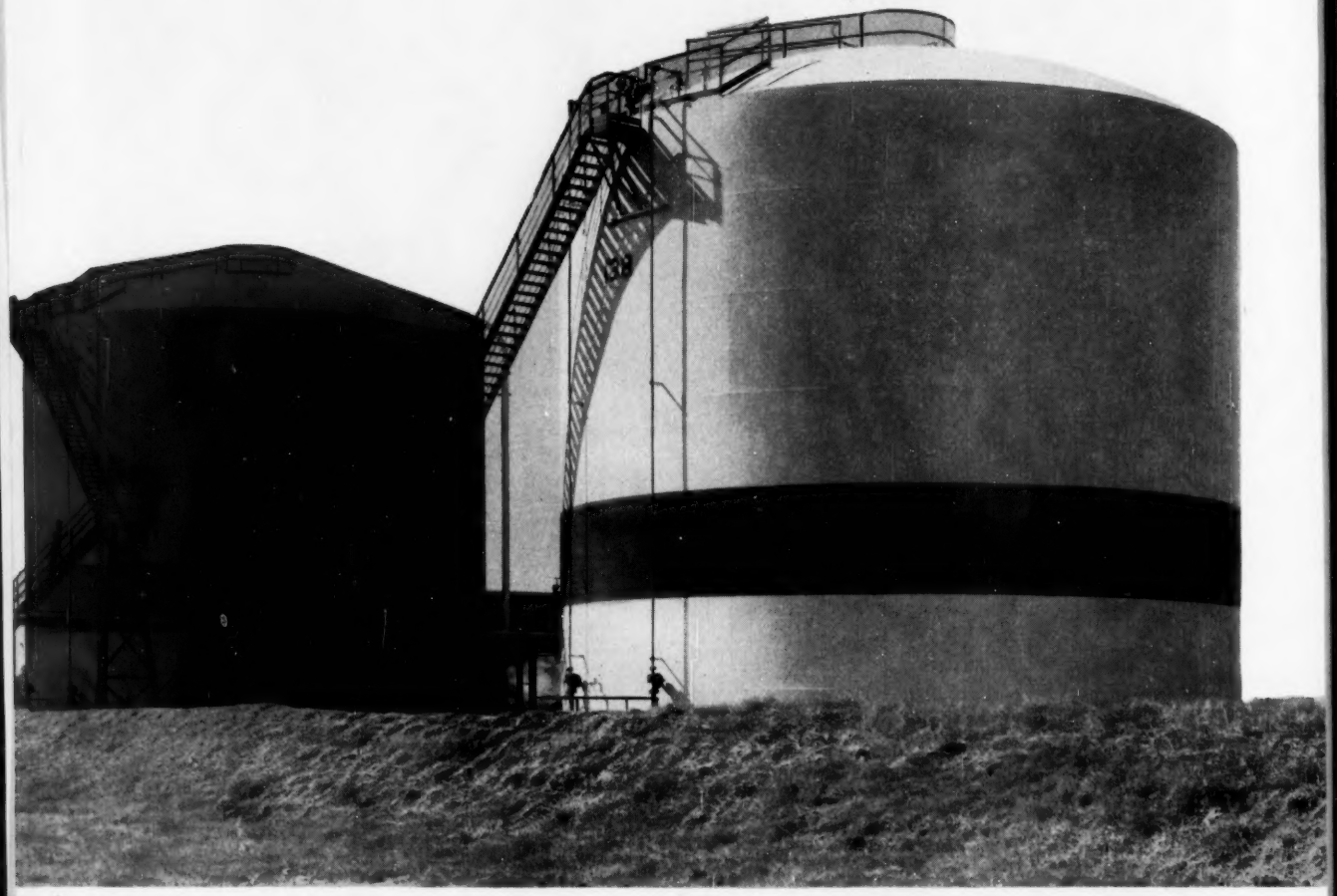
LOS ANGELES • NEW YORK • ATLANTA • SAN FRANCISCO • PORTLAND (ORE.)

Producers of: Lithium Carbonate • Lithium Hydroxide • Lithium Chloride • Lithium Bromide • Borax • Potash • Soda Ash • Salt Cake • Bromine • Chlorates • Perchlorates • Manganese Dioxide • Agricultural and Refrigerant Chemicals

Plants: TRONA and LOS ANGELES, CALIFORNIA
SAN ANTONIO, TEXAS (American Lithium Chemicals, Inc.)
HENDERSON, NEVADA

Export Division: 99 Park Avenue, New York 16, New York

The white tank is 5-10 degrees cooler, loses 15-20% less oil by evaporation. That's why heat-reflecting paints are expanding their industrial markets.



Cashing In on Cool Coatings

Despite the rising popularity of color in plants and refineries (*CW, July 28, p. 28*) the vivid hues do not have a clear field. There's solid sense in painting buses, airlines and oil tanks white when they face the sun.

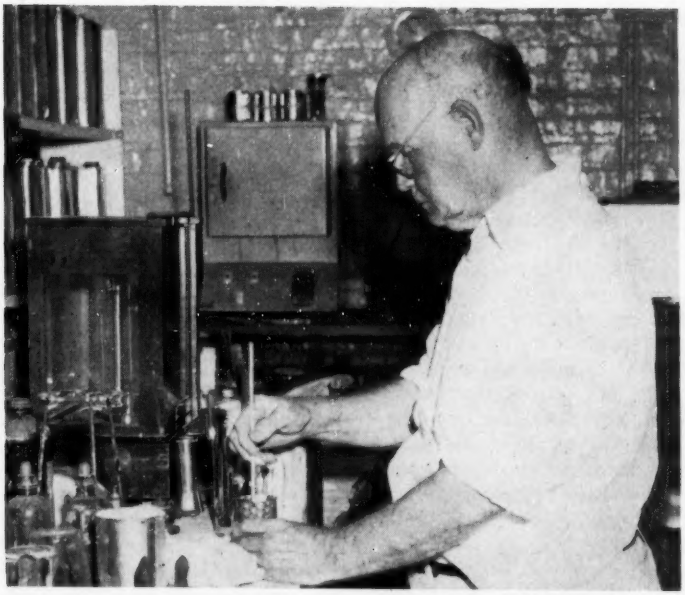
This demand for heat-reflective coatings is posing problems for paintmakers, because: actual market, right now, is small; in many parts of the U.S., it is seasonal; variety of surfaces in common use—wood, asphalt, masonry, aluminum, steel, and the like—makes it hard to devise a paint that will cover all building materials.

A firm that gives its exclusive attention to the problem of reflecting heat with paints is Coatings Laboratories, Inc.* (Tulsa, Okla.), created about three years ago to promote a coating called Plasticool. An acrylic-base, water-emulsion coating, the product can be applied to gravel-coated roofs, to sheet aluminum; aluminum-primed asphalt; fresh, unfilled wood; asphalt shingles; glass; and masonry. One drawback: high cost, $8-9/gal.

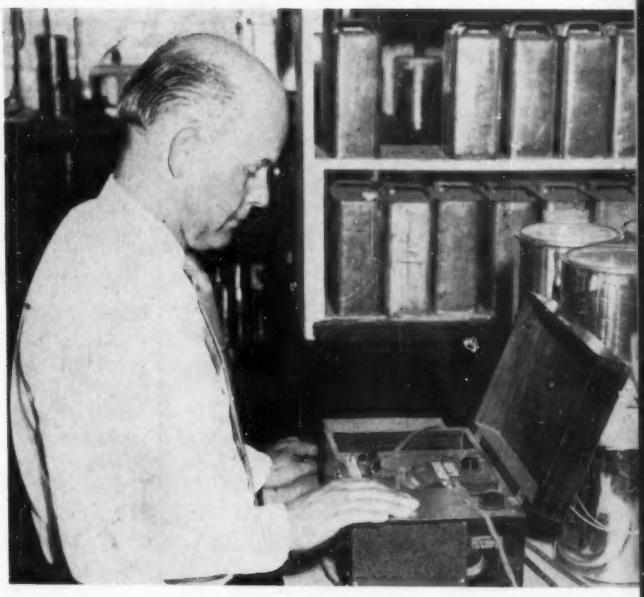
*Many major paint companies and even one paintmaker that is the affiliate of a refiner (Socony Paint Products Co.) produce the heat-reflective paints designed for oil tanks.

Infrared, Ultrahot: Practical tests in the oil fields have proved white coatings best. But even they do not reflect most of the sun's hot infrared rays. Other research has proved that texture as well as color influences reflectivity.

There are some indications, too, that durability, long the aim of paintmakers, may not be an important factor in seasonal uses. Possibility for this market: short-lived or strippable paints that are cheap, easy to apply.



Paint recovery is the novel business of Chicago's enterprising Richards family, Erwin (left) and William (below). Their profit represents savings to paint users that might otherwise see one-fourth of their paint wasted in overspray.



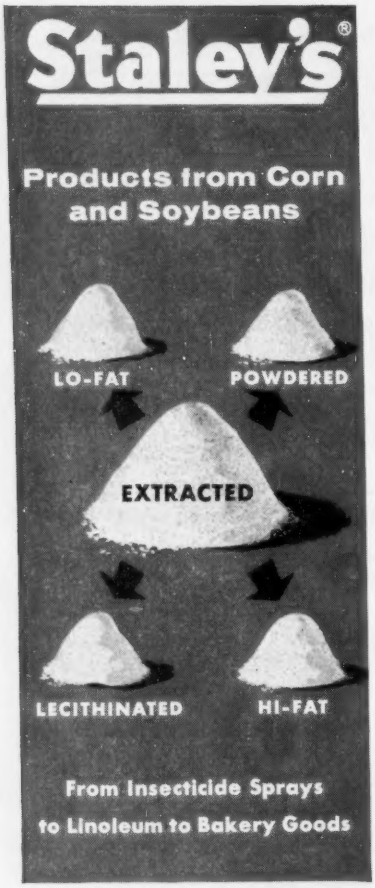
Spray Savers Give Painters Second Chance At Profits

Speed of application, evenness of coating, savings in labor are all well-known advantages of spray-painting. Trouble is, even the expert seldom can handle the spray gun as neatly as he handles a brush, and the paint that misses the target—it often runs as much as 20-50% of the total sprayed—is usually a complete loss. Moreover, the overspray must be collected and disposed of—a headache to many firms.

But overspray needn't be a costly problem, says W. C. Richards Co. (Blue Island, Ill., south of Chicago). Richards salvages the overspray sludge, reworks it, and produces a high-quality paint that can be returned to the original user and applied as new material.

Operating chiefly in the Midwest, Richards currently keeps some 25 employees busy turning out 40-50,000 gal. of "new" paint from old. Depending on the materials it has to work with, Richards makes either finishing coats or primer materials, which it can provide for about $1/gal. cheaper than new paint.

Custom Quality: In business since 1937, Richards is operated by William C. Richards and his father, Erwin. They don't claim to have originated the reclaimed-paint business—many firms reprocess their own materials, and some cheap house paints are



SOY FLOURS

SOY GRITS

A boon to bakers and the food processing industry. Staley's Soy Flours add high quality protein value to all food products. (2 lbs. of Staley's Soy Flour pack the protein content of 6 dozen eggs.) Soy flours help to retain moisture and freshness, add to body and texture and bring out color and flavor. Lecithinated soy flour supplies needed emulsifier and antioxidant properties. Staley's Soy Flours offer desirable properties to industrial users, too, in paint, insecticide, linoleum, plywood, and paper coating fields.

Processed by special solvent extraction methods, 5 kinds of Staley's Soy Flours are available. Your Staley representative will be glad to discuss your needs and recommend the grade best suited for your process. Or write for complete data.

For information about other Staley products; Lecithin, Leucine, Phytic Acid, Inositol, Tyrosine, MSG, HVP, Calcium Phytate, Amino Acid Mixtures, Corn Steep Liquor and Fermentation Nutrients, write:

1906 50 1956
ANNIVERSARY
A. E. Staley Mfg. Co.
DECATUR, ILLINOIS

Staley's

©1956-A. E. Staley Mfg. Co.

made of reworked material. What the Richards do claim is the manufacture of first-quality coatings from paint wastes. Their reputation is good enough to have earned them the job of reconditioning paints for several basic paint manufacturers. They recover products of all types—varnish, alkyd, epoxy-silicone, lacquers, almost any of the other film formers.

Overspray contains both the pigment and the vehicle (contaminated with water from the booth) of the original paint—only solvent is gone.

Richards takes the overspray sludge, grinds it up and adds new resin and solvents, dehydrates and clarifies it. It carefully culls the wastes used as starting materials, treats each on an individual basis. Richards claims it can rework a paint to equal the original.

Sample for Proof: Besides working out some ingenious techniques in paint-reclaiming, Richards has evolved a solid campaign to sell its services. At no cost to the painting firm, it will take a few drums of overspray, along with a quart of original paint, and put them through a rigorous analysis. It then devises a way to reprocess the waste to make a paint that will meet the potential customer's new-paint specifications, and tries this process using the sample sludge. Finally, it checks the finished product, and submits the reworked paint to the customer for tests.

Along with the paint, Richards outlines to the user a proposal containing projected annual savings. Under its contracts, Richards' customers pay only for the gallons of finished paint returned for re-use.

Once a customer is signed up, Richards helps set up the overspray collection system, since quality of the sludge is one of the most important factors in the "new" paint's quality.

Selected Sludge: Richards does not use the overspray accumulated on booths with strippable coatings, nor does it use booth-floor scrapings. The firm can effectively use only sludge from water-wash spray booths—the material that floats on the water surface (and not the sludge that sinks—this is controlled, largely, by additives in the wash water).

Richards suggests that the overspray be skimmed off twice each shift, and collected in 55-gal. open-head steel drums. It advises that sludge from finish coats and undercoats not be mixed, nor colors mixed. (Even if they are mixed, Richards can turn them into useful undercoating materials but not top-quality final coatings.) The firm suggests that sludge from baking enamels, for example, be kept apart from that of heat-resistant coatings, and dipping sludges apart from spray wastes. Customers send their sludge on to Richards on a weekly basis—in hot months, when the paint can "set up" faster, greater frequency is urged.

Water is drained from the resulting careful collection, leaving a non-sticky, puttylike mass. (But not all sludge arrives in this ideal state; it's sometimes as granular as sawdust.)

Lab Check: Richards examines each incoming batch of sludge in its own labs, to make sure it is suitable for reprocessing. It will reject some waste to avoid spoiling a batch—it's not unusual to find contaminants like glass, cardboard, and spray-masking materials in drums.

Acceptable waste is dumped into a Baker-Perkins dispersion mixer, and the reprocessing begun. New resins are added if needed, and solvents poured in. Vacuum distillation is employed to remove any remaining water, and the mix is clarified by centrifugation, screening or filtering (depending on the material being worked). The mix is then pigmented to meet color specifications, and lab-checked to make sure it lives up to the customer's precise specifications.

As the firm now operates, it takes about two weeks to cycle a paint through the plant—two weeks after he sends in sludge, the customer receives his "new" paint. Depending on color, vehicle, and the like, this reworked material costs about 40¢-$1.50/gal. less than comparable new material, freight charges included.

None Too Small: Counting among its customers such varied firms as manufacturers of kitchen cabinets, electrical appliances, structural steel, washing machines and toys, Richards finds that a paint user's size has little to do with whether it can benefit from reclaiming services.

While Richards appreciates its rather novel position as a paint supplier, it prefers to be known for the quality of its finishes. It has found both profit and challenge in making "new" paints from old.

Check the solvents you use

and see the advantages of

isobutyl acetate

☑ ***if you use n-Butyl Acetate,*** isobutyl acetate can be used interchangeably in most cases. In lacquer formulations, for example, isobutyl acetate can usually be substituted without any apparent change in handling characteristics of the lacquer or physical properties of the resulting film. And you do this with an 11% savings, at today's prices.

☑ ***if you use MIBK,*** by substituting isobutyl acetate, you achieve better blush resistance and improved flow-out, again with an 11% savings in cost. In addition, manufacturers using methyl isobutyl carbinol with MIBK to increase blush resistance and flow-out will find this unnecessary when they switch to isobutyl acetate—effecting a further savings.

☑ ***if you use n-Butyl Acetate with sec-Butyl Acetate or n-Propyl Acetate,*** your cost per gallon with any usable combination is probably greater than with isobutyl acetate alone. Moreover, isobutyl acetate gives better blush resistance and flow-out, and frees a storage tank for other purposes.

Eastman isobutyl acetate offers other advantages, in addition to lower cost and improved final product. The mild, pleasant odor of this solvent is preferred by most people over the stronger odor of n-butyl acetate. Its price is stable. And because it weighs less per gallon than n-butyl acetate, you save over $1,000 on every 8,000 gallon tank car you buy at current prices.

As a result, isobutyl acetate is finding wide acceptance as a lacquer solvent in its own right, as well as a satisfactory replacement for more expensive solvents. For additional information on this Eastman solvent, contact our nearest sales office or write to EASTMAN CHEMICAL PRODUCTS, INC., Chemicals Division, KINGSPORT, TENNESSEE.

Eastman
CHEMICAL PRODUCTS, INC.
KINGSPORT, TENNESSEE
subsidiary of EASTMAN KODAK COMPANY

SALES OFFICES: Eastman Chemical Products, Inc., Kingsport, Tennessee; New York City; Framingham, Mass.; Cincinnati; Cleveland; Chicago; St. Louis; Houston. **West Coast: Wilson Meyer Co.,** San Francisco; Los Angeles; Portland; Salt Lake City; Seattle.

in the development stage .....when

call on Mallinckrodt®

For manufacturers of **transistor** and other **semi-conductor** devices,

Mallinckrodt introduced this year **TRANSISTARS***

Acetone TransistAR
Acid Acetic Glacial TransistAR
Acid Hydrofluoric 48% TransistAR
Acid Hydrochloric TransistAR
Acid Nitric TransistAR
Acid Sulfuric TransistAR
Alcohol Isopropyl TransistAR
Alcohol Methyl Absolute TransistAR
Ammonium Hydroxide TransistAR
Carbon Tetrachloride TransistAR
Ether Anhydrous TransistAR
Hydrogen Peroxide TransistAR
Hydrogen Peroxide Solution 30% Stabilized TransistAR
Sodium Carbonate Monohydrate TransistAR

*Trademark

we can contribute most to the solution of your chemical problems

Since the earliest days of the television industry, Mallinckrodt has been a supplier of chemicals necessary to the manufacture of efficient phosphors . . . precision chemicals with a minimum of impurities which poison phosphors . . . uniform chemicals where controlled physical form is of utmost importance. Mallinckrodt silicic acid, for example, is manufactured in three different forms to meet industry's demands for purity, particle size and bulk.

This experience will be of great assistance to you in solving your chemical problems.

MALLINCKRODT STANDARD LUMINESCENT (S.L.®) CHEMICALS USED FOR PHOSPHOR PRODUCTION . . .

ACID SILICIC S.L. • AMMONIUM CHLORIDE S.L. • BARIUM CARBONATE S.L. • CALCIUM CARBONATE S.L. • CALCIUM FLUORIDE S.L. CALCIUM PHOSPHATE DIBASIC S.L. • MAGNESIUM CARBONATE S.L. • MAGNESIUM OXIDE S.L. • MANGANESE CARBONATE S.L. STRONTIUM CHLORIDE ANHYDROUS S.L.

MALLINCKRODT CHEMICAL WORKS

SECOND & MALLINCKRODT STREETS, ST. LOUIS 7, MO. • 72 GOLD STREET, NEW YORK 8, N. Y.
CHICAGO • CINCINNATI • CLEVELAND • DETROIT • LOS ANGELES • PHILADELPHIA • SAN FRANCISCO
IN CANADA: MALLINCKRODT CHEMICAL WORKS LIMITED • MONTREAL • TORONTO

Mallinckrodt High Purity Chemicals used extensively in the electronic industry

Acids
Acetic Acid
Boric Acid
Chromic Acid
Chromium Trioxide
Hydrofluoric Acid
Nitric Acid
Sulfuric Acid

Aluminum
Aluminum Chloride
Aluminum Nitrate

Ammonium
Ammonium Bifluoride
Ammonium Carbonate
Ammonium Phosphate Dibasic

Barium
Barium Acetate
Barium Carbonate
Barium Chloride
Barium Nitrate

Cadmium
Cadmium Chloride
Cadmium Nitrate
Cadmium Sulfate

Calcium
Calcium Carbonate
Calcium Chloride
Calcium Fluoride
Calcium Nitrate
Calcium Phosphate Dibasic

Copper
Cupric Sulfate
Cuprous Chloride

Lithium
Lithium Carbonate
Lithium Chloride
Lithium Sulfate

Magnesium
Magnesium Carbonate
Magnesium Oxide

Manganese
Manganese Chloride
Manganese Carbonate
Manganese Sulfate

Mercury
Mercury Metal
Mercuric Oxide

Nickel
Nickel Nitrate

Potassium
Potassium Cyanide
Potassium Dichromate

Silicate
Silicic Acid

Silver
Silver Cyanide
Silver Nitrate
Silver Oxide

Sodium
Sodium Carbonate
Sodium Dichromate
Sodium Hydroxide

Solvents and Organics
Benzene
Carbon Tetrachloride
Chloroform
Ether
Ethyl Acetate
Isopropyl Alcohol
Methyl Alcohol
Toluene

Stearates
Calcium Stearate
Magnesium Stearate
Zinc Stearate

Strontium
Strontium Chloride
Strontium Nitrate

Zinc
Zinc Metal
Zinc Chloride
Zinc Oxide
Zinc Sulfate

C W Report

A Better Way to Plan Your Company's Growth
An experience-proved system. 35¢ ☐

Guided Missiles
All that may be told about the guided missiles program — a multimillion-dollar/year opportunity for chemicals. 60¢ ☐

Coatings: How to Sell a $700-Million Market
The author contends that many companies are taking the wrong approach to selling this intricate market. 50¢ ☐

Your Future in Nuclear Energy
Evaluation of nuclear energy as a new process industry, a new process tool and a new market for chemicals. 50¢ ☐

Executive Development
A how-to-do-it article, with case study, on building management in depth. 50¢ ☐

Plastics
Detailed analysis of the plastics industry, including outlook and 18 pp. of product data. 75¢ ☐

Synthetic Detergents
Profile, with detailed product information, of this 2.5-billion-lb. business. 75¢ ☐

Chemical Week
Reprint Dept., Room 2400
330 W. 42nd St.
New York 36, N. Y.

Please send me the CW Reports checked above. Enclosed is $.....

Send price of ..... copies of .....

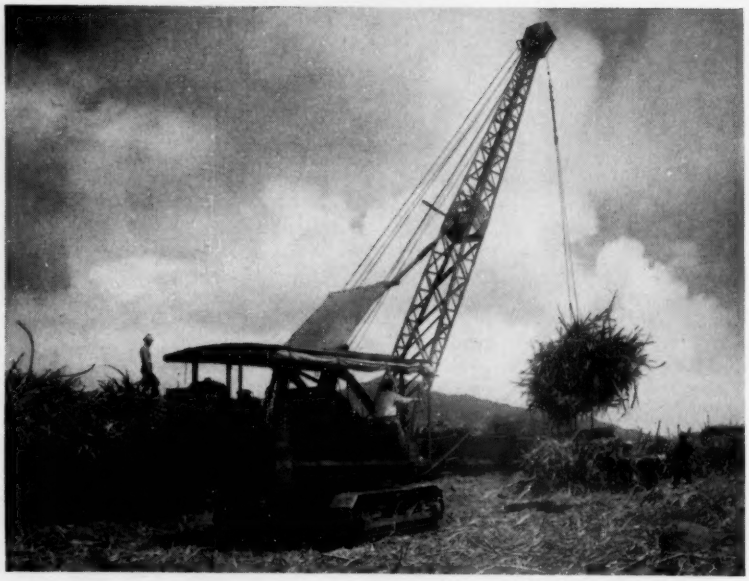
Name .....

Address .....

.....

.....

(Bulk prices, available on request, apply to more than 10 copies of a single report.)



SUGAR HARVEST: For more sugar/acre, $2 million worth of chemicals.

Chemicals' Sweet Dividends

After several years of research, the Hawaiian Sugar Planters Assn. is close to beating the cane-tasseling problem. This flowering or tasseling of the sugar cane uses up sugar by converting it into cellulose for growth energy. Now, chemical reduction of tasseling promises a substantial increase in sugar yield—producing as much as $180 of new revenue per acre—as well as to open a chemical market with a $2-million potential.

Maleic hydrazide made by Naugatuck Chemical Division of U.S. Rubber is the key to the chemical treatment. This chemical has already proved highly successful in solving a similar problem — chasing money-wasting "suckers" from tobacco plants (*CW, Feb. 6, '54, p. 56*)—with a resultant increase of as much as 150 lbs./acre in tobacco yield. Close to a million dollars worth of the chemical is sold annually to tobacco planters.

The treatment with maleic hydrazide (4-5 lbs./acre) and other chemicals, such as Du Pont's CMU (chlorophenyl dimethylurea), was developed by Leonard Baver at the experiment station in Hawaii.*

Several other methods of combating tasseling, such as lighting fields at night (interrupts growth cycle, inhibits flowering) and withholding irrigation water, were also tried.

Light control proved expensive to install and operate. Water control is possible only on irrigated plantations in nonrainy areas and may result in overdrying, but it's cheap, may yet be extensively used.

But chemical control — with its relative effectiveness, lower costs ($6 to $25/acre for chemicals, plus $1.50/acre for plane spray) and ease in handling—best meets the requirements, and seems applicable to a larger part of the 200,000 acres of Hawaiian cane.

With these considerations, it seems likely that in a season or two the chemical treatment, with maleic hydrazide as the keystone, may be in general use in Hawaii, although it still has shortcomings—e.g., expense of plane-spraying, possibility that rain may wash away the chemical.

The net result of these experiments may be an addition of more than 300,000 tons to the million tons of Hawaiian sugar already produced annually. It would mean added revenue of $35-40 million/year, and that's good news to growers, the research-minded Hawaiian Sugar Assn. and the chemical producers.

*About 500 acres of land is involved in this privately directed and financed project. Tasseling is an acute problem on the islands because of the long growing season.

FORMVAR . . .
the industry standard
Formvar phenolic enamelled wire is wire with a balance of properties. It passes all ASTM tests.
Formvar phenolic passes tests of enamellers who demand a smooth coating that is easy to apply. It passes the tests of motor manufacturers and users who demand an enamel that stands up under automatic winding and under severe operating conditions.
Formvar is the registered trade name for polyvinyl formal produced and sold only by Shawinigan Resins Corporation. When combined with an alkyl phenolic resin it becomes that tough, heat resistant wire enamel popularly known as "Formvar enamel." 75% of all magnet wire used today is enamelled with Formvar phenolic.
Exercise of exacting production controls and active research into variations of the basic formulae keep Formvar a uniform and dependable ingredient in proved wire enamels. Look to Shawinigan and Formvar for continued progress. Shawinigan Resins Corporation, Department 1133, Springfield 1, Mass.
FORMVAR® for wire enamels by
SHAWINIGAN
RESINS

Found ...in B&O's Land of Big Opportunity

A 64 acre site—or *any other acreage you need!*

Let B&O's long and varied experience in plant location *go to work for you!*

B&O's Land of Big Opportunity is the *proved center* for national distribution . . . resources are tremendous . . . power plentiful, rail transportation fast and dependable. Without question, we can suggest a site to suit! Look them over on the ground, or see them *at your desk* in *3-dimensional color* and *air views. Ask our man!*

THIS SPECIAL STUDY ON REQUEST FROM The B&O Railroad, Baltimore 1, Md.

YOU CAN REACH HIM AT:
BALTIMORE 1—LExington 9-0400
NEW YORK 4—DIgby 4-1600 CINCINNATI 2—DUnbar 1-2900
PITTSBURGH 22—COurt 1-6220 CHICAGO 7—WAbash 2-2211

Baltimore & Ohio Railroad
Constantly *doing things*—better!

SPECIALTIES

Blue Note

Purex Corp. Ltd. (South Gate, Calif.) plans to change its distribution system (Oct. 1) over to direct sales representation. The new policy, brought about by Purex's entry into the household soap field when it acquired Manhattan Soap Co., will give it a system more closely akin to those of other firms in the wash-product field. Purex had been distributing through a combination of 82 food brokers and its own salesmen; Manhattan had the direct setup all along.

Purex has another change up its sleeve: Dutch Cleanser, the scouring powder it took over from Cudahy Packing Co. last year, will be tinted blue. Purex, too, has altered formulation, labeling and promotion of Old Dutch, and it says sales have jumped 300% in the last year.

'Copter vs. Caterpillars

SPECIALLY equipped with spray booms, a helicopter was enlisted by the British Petroleum Co. a few weeks ago to quell an invasion of West Germany by caterpillars. The pests threatened pine trees in the Mittelfranken region, until a vigorous campaign with DDT (25%) in diesel oil wiped them out. (Because of the smallness of cleared areas in the woods, airplanes were not practical.) The helicopter was guided to the infested patches of forest by balloons, which marked off the target areas.

"You'll find 'Hexalin'® cyclohexanol a versatile solvent, stabilizer and intermediate"

"It's a particularly good solvent for gums, resins and waxes. And many other uses for 'Hexalin' are growing, too," reports Fred Wolff, Du Pont Polychemicals representative in Illinois and eastern Iowa.

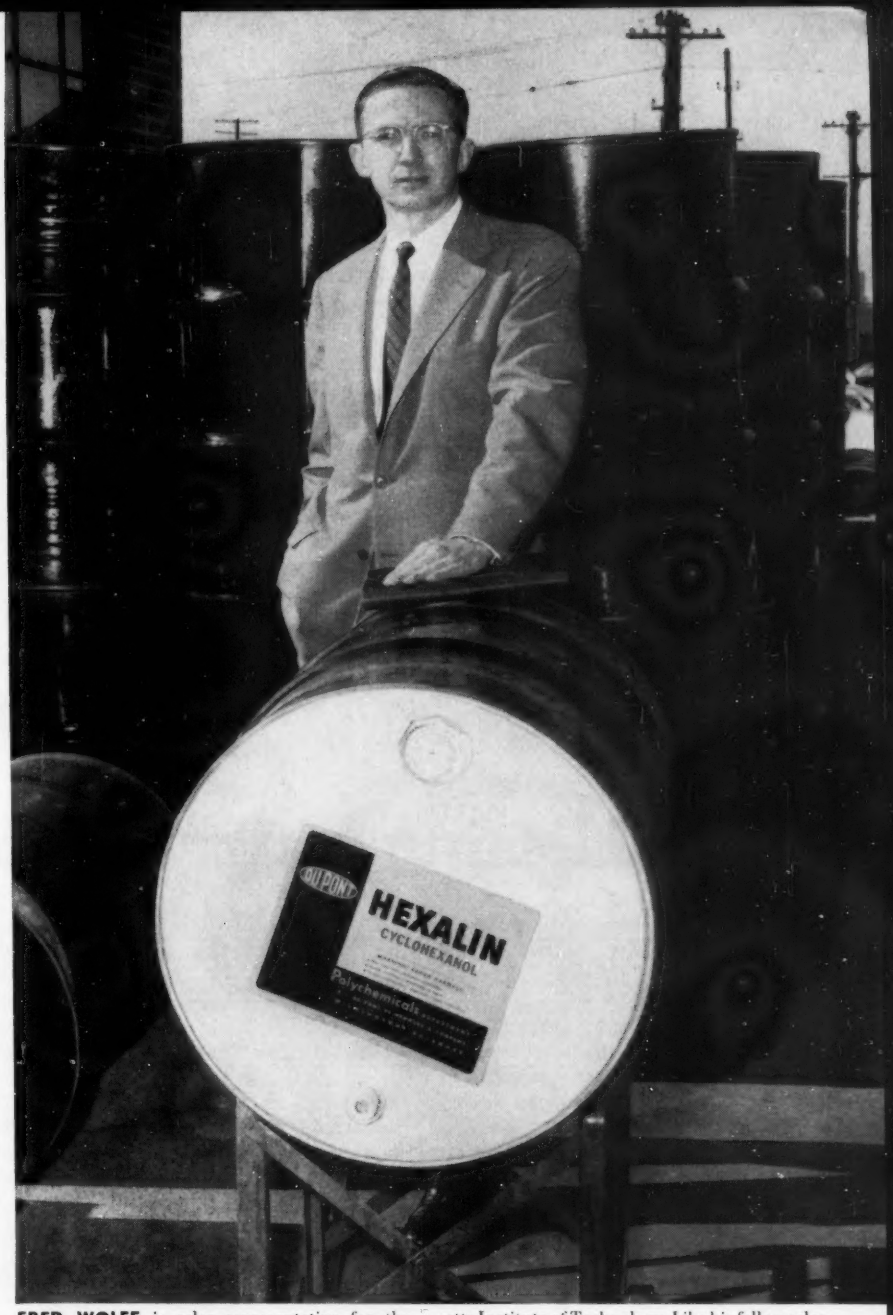
In the plastics field, "Hexalin" is reacted with organic acids to form esters for use in plasticizers. In textiles, it's a proven stabilizer for soaps and a solvent for dyes. Lacquers, varnishes, non-corrosive degreasing agents and thinners for petroleum additives are other products where the solvent power of "Hexalin" is useful in industry.

Are there any ideas here for you? To refresh your memory: "Hexalin" cyclohexanol is a clear, oily liquid with a boiling range at 760 mm. of 160.0°C. Min. to 162.4°C. Max. Its specific gravity (25°/25°C.) is 0.946-0.950.

We'll be glad to send additional information on to you promptly. And, remember, you can rely on Du Pont for fast delivery of a uniform, high-quality product . . . whether in tank cars or drums.

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY



FRED WOLFF is sales representative for the Du Pont Polychemicals Department in Illinois and eastern Iowa. Fred received his chemical engineering training at Princeton and Massachusetts Institute of Technology. Like his fellow salesmen, Fred works closely with customers throughout his territory in determining individual chemical requirements.

FOR ADDITIONAL INFORMATION ON SPECIFICATIONS, PROPERTIES AND USES, MAIL THIS COUPON

Which of these other chemicals are you interested in?

- ☐ ADIPIC ACID
- ☐ CRYSTAL AND SHOTTED UREA
- ☐ DIGLYCOLIC ACID
- ☐ HYDROXYACETIC ACID
- ☐ "HYTROL"® O CYCLOHEXANONE
- ☐ "LOROL"® FATTY ALCOHOLS
- ☐ METHANOL

E. I. du Pont de Nemours & Co. (Inc.)
Polychemicals Dept. 608, Wilmington 98, Del.

Please send me full information on Du Pont "Hexalin" cyclohexanol. I am particularly interested in using "Hexalin" for the following applications:

_____

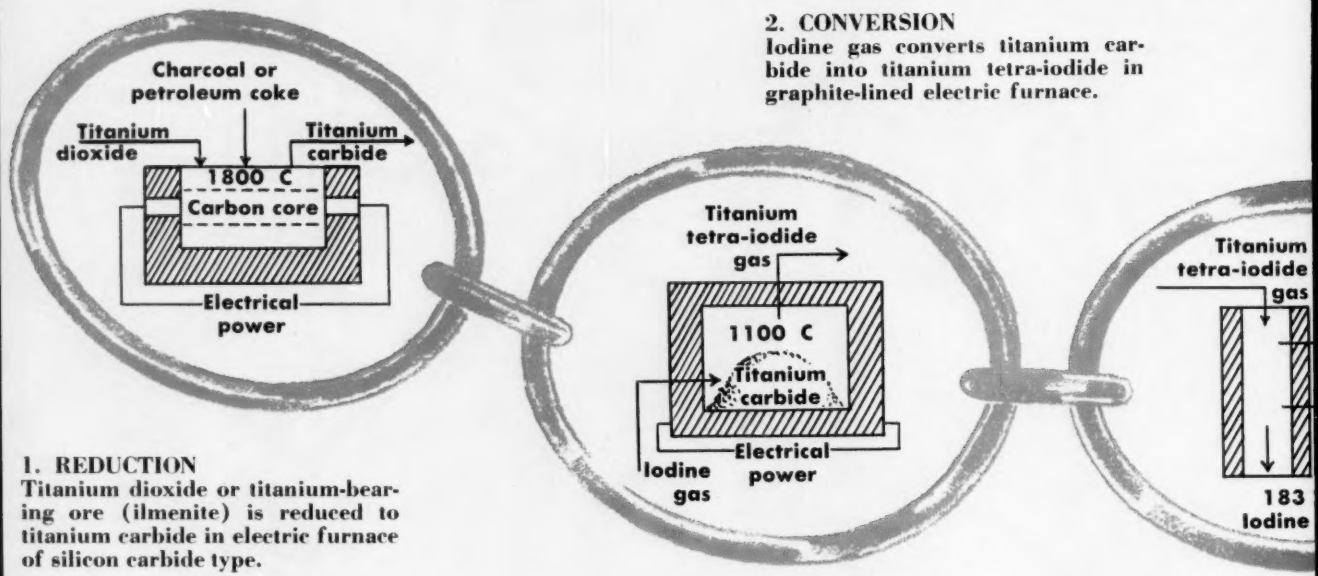
_____

Name _____ *Position* _____

Firm _____

Address _____

City _____ *State* _____



1. REDUCTION
Titanium dioxide or titanium-bearing ore (ilmenite) is reduced to titanium carbide in electric furnace of silicon carbide type.

2. CONVERSION
Iodine gas converts titanium carbide into titanium tetra-iodide in graphite-lined electric furnace.

The Missing Link: Key to the Next

Thermal dissociation of titanium tetra-iodide is a lot closer to being commercial than most people think.

Kennecott Copper has made it continuous, is thinking of building a plant for it.

Here's how the process shapes up for the battle ahead:

A POLL of titanium experts on the titanium process sketched above would undoubtedly reveal a near-unanimous feeling. They'd tag it least likely to succeed commercially. But they could be wrong.

Kennecott Copper has been pushing development work on the process for several years. It has made the process continuous. And right now, the method may be ready to don commercial trappings. The company is not saying very much about its titanium intentions. But it has completed plans for a 1,000-tons/year semicommercial plant, and for some time has been eager to start building. Within the past few weeks, it has taken a land option in Niagara Falls, probably for a titanium unit. And it has been talking with Niagara Mohawk about power rates and availability for titanium manufacture there.

30-Year Wonder: The process that Kennecott has been exploring involves the thermal decomposition of titanium tetra-iodide. Chemically, it's the same process that was developed at the Philips Gloelampen Fabrik in Holland about 30 years ago. It's also the same process used by Foote Mineral and New Jersey Zinc to make high-purity titanium for specialized uses.

Kennecott, however, has made some drastic modifications of the basic process. The fundamental work was done by a consultant, Alfred Loonam; process development has been carried forth at Battelle Memorial Institute for the last several years. Kennecott has been very chary about discussing the process at all. But it has said that a 200-lbs./day pilot plant operated in 1953-54 established the fact that the process could be carried out continuously and was capable of producing a high-purity, uniform product. It has also reported that a larger unit was operated successfully in 1954. And it indicated that greater economies could probably be obtained in a still larger plant.

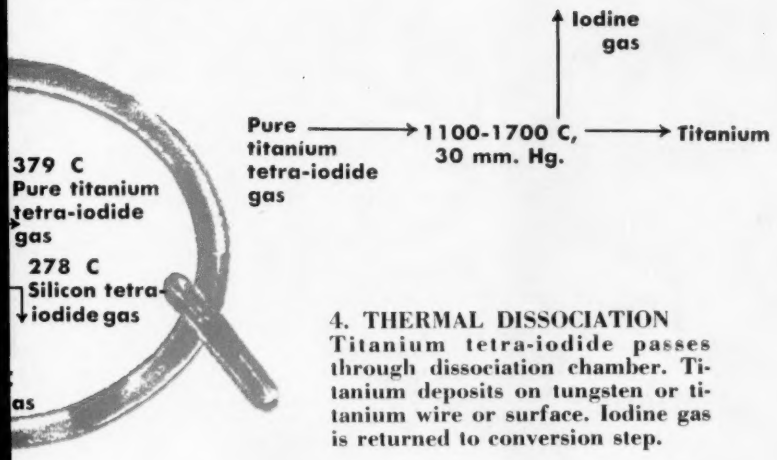
About all that Kennecott has publicly admitted about the nature of the process is that it's a thermal dissociation. But there's no doubt that the process is the one covered by Loonam's patents (U.S. 2,519,386; 2,694,653; 2,714,564; 2,694,654).

According to those patents, the process works like this. Rutile or ilmenite is converted into titanium carbide. The operation is similar to the production of silicon carbide; it's carried out in an electric arc furnace, and either petroleum coke or charcoal can be used for reduction. The reaction goes at atmospheric pressure and 1800 C.

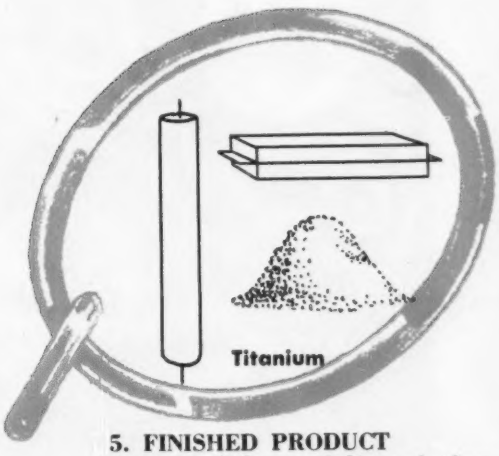
Carbide is crushed; it reacts with gaseous iodide at 1,100 C in another electric reduction furnace to produce the tetra-iodide. Purification can be accomplished either through fractional condensation or by condensation followed by fractional distillation. Because of the wide variation in boiling points*, this step should offer no particular problem.

*Titanium tetra-iodide: 379 C; silicon tetra-iodide: 278 C; iodine: 183 C.

3. PURIFICATION
Titanium tetra-iodide is purified by fractionation — controlled cooling under vacuum.



4. THERMAL DISSOCIATION
Titanium tetra-iodide passes through dissociation chamber. Titanium deposits on tungsten or titanium wire or surface. Iodine gas is returned to conversion step.



5. FINISHED PRODUCT
Design of thermal dissociation chamber determines form of product: titanium rod formed on wire core; sheet formed on metal surface; or powdered crystals.

Commercial Titanium Process?

Continuous in the Chamber: Purified titanium tetra-iodide is fed to the dissociation chamber. Titanium crystals deposit on a surface of tungsten, titanium or other material heated to 1100-1700 C, and gaseous materials are condensed to recover the iodine.

What the patents do not reveal is precisely how the deposition is handled so that the process can be carried out continuously. This is a mechanical problem to which there are several possible solutions. For instance, the titanium could be deposited on a titanium wire. After it's formed, the wire could be withdrawn through a lock in the chamber into another chamber containing an inert gas (e.g., argon). A new wire could then be passed through the same lock. Or, the deposition surface could be scraped clean of titanium while in the chamber.

Regardless of how the deposition step is carried out, titanium's reactivity at high temperatures means that it would have to be moved to a chamber filled with an inert gas for cooling prior to melting into ingots.

Two Sides of the Question: Most producers of titanium use the Kroll process (magnesium reduction of the tetrachloride). Union Carbide's decision to utilize a sodium reduction has revitalized interest in that approach. And an enormous amount of research time and money has been pumped into electrolytic processes.

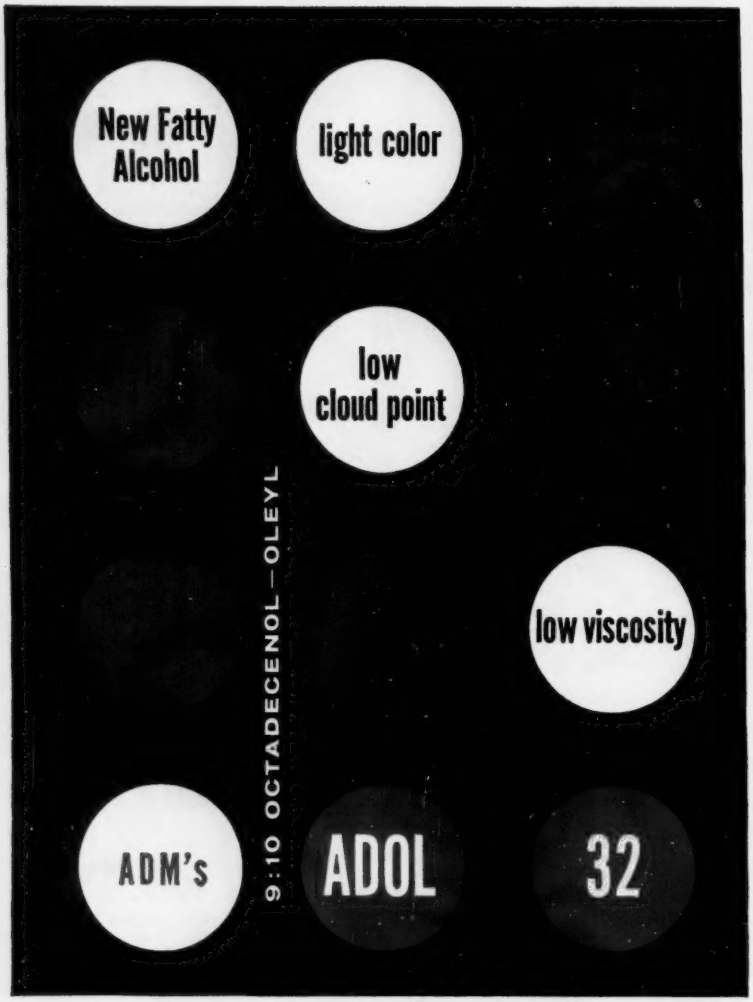
Most people, however, have completely shied away from the tetra-iodide dissociation as a route to commercial titanium. They point out that iodine is not as easy to work with as chlorine. Also, they point to the fact that it's more expensive than chlorine. In addition, reaction temperatures are high and materials of construction would pose problems. Finally, they conclude that making the process continuous is quite a trick.

The small minority who regard the process favorably look at it this way: the process has long been recognized as a method of getting titanium of exceptional purity (although great strides in that direction have been made by other processes recently). They feel that it gives less reactive gaseous by-products. It might prove to be a method that could be readily adapted to titanium scrap as a feed stock.

Regarding the continuous features, they are quick to point out that many people are coming to the conclusion that the Kroll process is inherently a batch method. In contrast, the tetra-iodide dissociation has proved capable —by firms others than Kennecott— of being converted to continuous operation. Foote Mineral uses a continuous thermal dissociation of silicon tetra-iodide for making high-purity silicon. The problems Foote solved would be comparable to those Kennecott faced in converting the titanium process to a continuous operation.

Integrated Both Ways: Kennecott, of course, has had a long-standing interest in titanium. It owns two thirds of Quebec Iron & Titanium (Canada). That firm reduces ilmenite to iron and a titanium-rich slag that is a highly regarded potential raw material for titanium (*CW Technology Newsletter, Aug. 11*). Through its Chase Brass & Copper, it has a large stake in titanium fabrication.

For several years, Kennecott has demonstrated a willingness to put up a semicommercial titanium plant. Now, with a lot of process development behind it and with some solid piloting experience, it may at last take the big step. If it does, a lot of experts are going to have to revise their estimates.



Hydrofol PRODUCTS

Hydrogenated and Distilled Fatty Acids and Stearic Acid . . . Hydrogenated Vegetable, Fish, Sperm Oil and Tallow . . . Hydrogenated Castor Oil . . . Stearyl, Cetyl, Oleyl Alcohol . . . Sperm Oils and Spermaceti . . . Behenic Acid . . . Erucic Acid . . . Hydroxystearic Acid.

Chemifats that put SELL into your products

Want to test a high-quality liquid fatty alcohol with excellent color stability, low viscosity, and high chemical reactivity? Write ADM for a sample of ADOL 32, a straight chain unsaturated monohydric alcohol, essentially oleyl. Chemical reactive groups include one double bond and one hydroxyl group. This material is non-corrosive and soluble in a wide variety of solvents.

These characteristics make ADOL 32 ideal as an emollient, a super-fatting agent, and a compound for detergents. Other possible applications—chemical intermediates, surfactants, soaps, germicides, emulsifiers, resins, plasticizers, textiles, lubricating oil additives, cutting oil bases and sulfonates.

ADOL 32, as well as thirty new fatty alcohols (many never before available), is being produced at ADM's new Ashtabula, Ohio, plant. Warehouse stocks are being maintained for immediate shipment in drums or tank cars. Be sure to keep posted by writing for our latest Chemical Reactions Bulletin No. 907R and Specifications Bulletin No. 908A.

Archer·Daniels·Midland Company
CHEMICAL PRODUCTS DIVISION
2191 WEST 110th STREET • CLEVELAND 2, OHIO

PRODUCTION

PROCESSES

Treatment of Virgin Gas Oil: The first furfural refining unit for the treatment of virgin gas oil cracking stock is now onstream at Texaco's Los Angeles Works. The furfural refining process, previously used for the refining of lubricating oils, is expected to improve quality and yield of fluid cat-cracked gasoline in its new role. It's said to increase catalyst life, also.

The new unit uses centrifugal extractors instead of the packed towers of other furfural refining installations. It takes virgin gas oil, decreases the sulfur content, extracts metal contaminants, reduces the content of aromatics, yields about 94% raffinate. Gas oil charge capacity is 25,000 bbls./operating day. The unit will also be used to refine cracking stock from the refinery's new deasphalting unit.

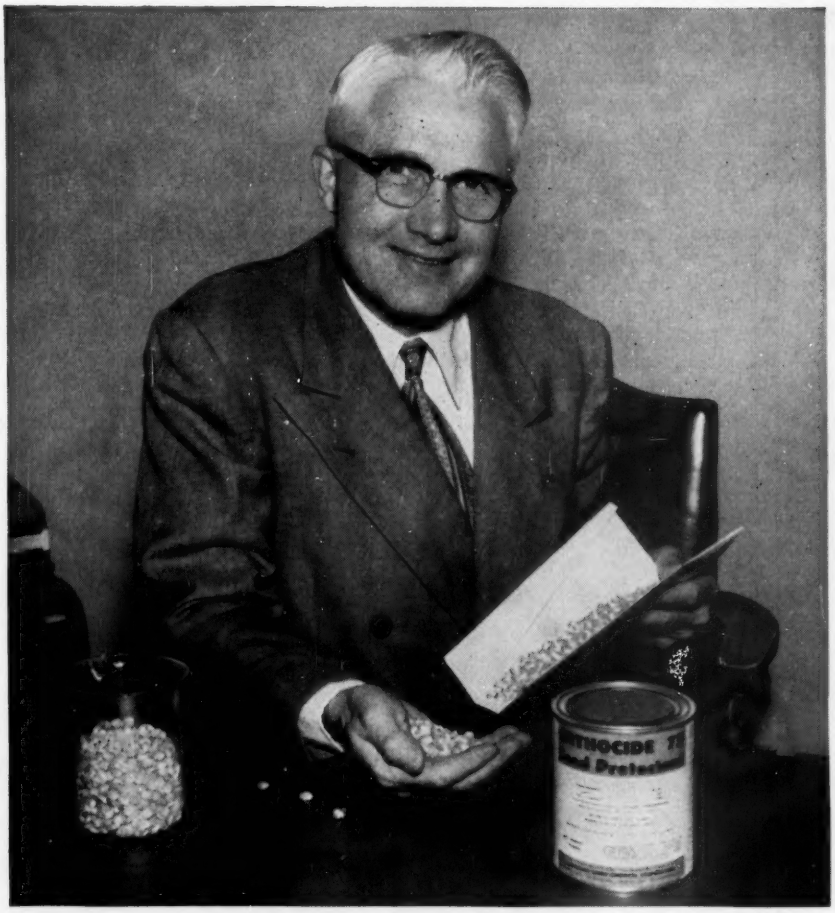
•

Pollution Control: The Crossett Co. will add a new water holding basin and settling pool to its antipollution system on the Ouachita River and tributaries near Crossett, Ark., site of its papermaking and chemical operations. The holding basin will be used as the first stage where suspended and dissolved materials in the plants' wastes absorb oxygen. A 200-ft.-wide concrete spillway will direct overflow to the settling pool, where it can be held for 25 days. Waste water will then flow into the system's 175-acre lake.

The new construction will cover 264 acres, add 625 million gal. (equal to the plants' 25-day waste discharge) holding capacity. The water will retain some color and odor, but aquatic life in the streams will not be affected, Crossett says. Laboratory tests will continue to be made at points up to 29 miles downstream from the point of discharge.

•

Synthetic Rubber: Shell Chemical says it will complete this fall a new unit at Torrance, Calif., to produce a special latex for foam rubber products. It's part of a general expansion program at the plant that will include extensions to butadiene facilities and modernization of the copolymer plant. When construction is completed, the copolymer plant will be able to make a broader range of rubber types, turn out almost 25% more.



L. R. Gardner, Vice President and Director, and Manager of Research & Development Department, of California Spray-Chemical Corp., examines seeds which have been treated with ORTHOCIDE 75 Seed Protectant.

"We know the advantages of the Pluronic series in solving application problems"

— says L. R. Gardner, Vice President, California Spray-Chemical Corp., Richmond, California

"As the world's largest formulator of agricultural chemicals, we are constantly researching surface-active agents for our many products for the farm, ranch, and garden.

"We have used Wyandotte Pluronics consistently, over the past three years, in manufacturing our captan-based ORTHOCIDE 75 Seed Protectant. They are employed as a secondary emulsifier, making use of their excellent dispersing action.

"We have noted the unique qualities of the Pluronic series, and the advantages of the interrelationship of the various grades, as shown on the Pluronic Grid. Now, we are working with them toward solving problems in other applications as well."

It is highly likely that your products, too, can be improved by using Wyandotte's Pluronic* nonionic surfactants. Our newly compiled "Pluronic Grid" can help you select grades with the best balance of properties for your application. By evaluating these grades in your laboratories, you will be able to choose those which best answer your needs.

Wyandotte Pluronics provide an over-all balance of desirable properties: ease of formulation, stability, controlled sudsing, a range of surface-active properties, low hygroscopicity, dedusting properties, and a low order of toxicity.

Check into the many benefits Pluronics can bring to your products. Write us today for further information, and your copy of the Pluronic Grid. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in principal cities.* *REG. U.S. PAT. OFF.

Wyandotte
CHEMICALS
MICHIGAN ALKALI DIVISION
HEADQUARTERS FOR ALKALIES

Soda Ash • Caustic Soda • Bicarbonate of Soda • Chlorine
Muriatic Acid • Calcium Carbonate • Calcium Chloride
Glycols • Chlorinated Solvents • Synthetic Detergents
Other Organic and Inorganic Chemicals

It's better to get it from Eastman . . .

Sure, when you need an uncommon organic (or an uncommonly pure one) in more-than-test-tube and less-than-tank-car quantities, try Eastman Organic Chemicals Department, *Distillation Products Industries,* Rochester 3, N. Y.

DPi

there are some 3500 Eastman Organic Chemicals for science and industry

DISTILLATION PRODUCTS INDUSTRIES
... *is a division of*
EASTMAN KODAK COMPANY

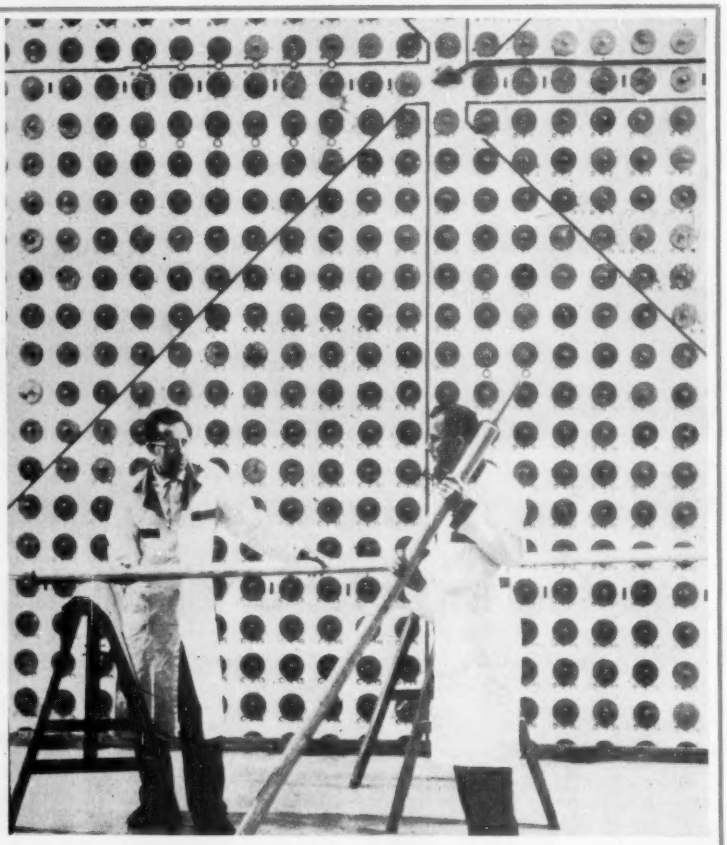
PRODUCTION

Vegetable Oil: A new filtration-extraction process, developed by the U.S. Dept. of Agriculture, has received a vote of confidence from Mississippi Cottonseed Products Co. After extensive trials at its Greenwood, Miss., plant, MCP is building a new unit at Hollandale, Miss.

The process, perfected at USDA's Southern Utilization Research Branch in New Orleans, requires only rolling, cooking and crisping of oilseeds before solvent extraction. It's well suited for small and medium-size mills —the Hollandale plant will be able to process 140-200 tons/day of cottonseed, 80-130 tons/day of soybeans. And the process will handle many different oilseed types with only slight modifications.

EQUIPMENT

Iron Filter: Micron iron particles can be separated from high-density (200-300 mesh) dry and liquid ma-



Does Nuclear Refining Come Next?

THE SCIENTISTS (*above*) are inspecting a "loop" before inserting it in the atomic pile of the Brookhaven National Laboratories. They're in the atomic program of Atlantic Refining (Philadelphia)—and the loop is simply an aluminum tube encased in a tubular shell. It's inserted in the pile, and petroleum samples are continuously fed through it. In that way, the researchers hope to appraise the possibilities of atomic radiation in full-scale processing. They also want to ascertain whether or not radiation can produce petroleum products that are unobtainable by more-conventional processing methods.

new FROM SHARPLES

SHARPLES TECHNICAL

DIMETHYLAMINOETHANOL*

AND

DIETHYLAMINOETHANOL*

TECHNICAL GRADES OF

*DMAE

AND

*DEAE

offer you a low-cost way of using these versatile compounds

Both Contain: Basic tertiary nitrogen plus one alcohol group

DMAE $(CH_3)_2NCH_2CH_2OH$

DEAE $(C_2H_5)_2NCH_2CH_2OH$

. . . and here are some of the actual commercial applications where these products are useful:

1. Fugitive emulsifier amine soaps. (Floor waxes; auto polishes).
2. Volatile boiler water corrosion inhibitors (pH adjusters).
3. Intermediates for ion exchange resins.
4. Intermediates for lube oil additives.
5. Rust preventives (in hydrocarbon and aqueous systems).

SHARPLES CHEMICALS Division

PENNSYLVANIA SALT MANUFACTURING COMPANY

Pennsalt Chemicals

500 Fifth Ave., New York • 80 E. Jackson Boulevard, Chicago • 106 S. Main St., Akron

Executive Office: Philadelphia, Pa.

Martin, Hoyt & Milne Inc., San Francisco • Los Angeles • Seattle • Portland

Shawinigan Chemicals, Ltd.: Montreal • Toronto

Airco Company International, New York

Write for Sharples Report 55-4 on DMAE 281 and Report 55-5 on DEAE 282 on the uses, properties and chemistry of these amine alcohols, to guide you in your evaluation of these compounds.

here's the most efficient mixer developed in years

✔ *reduces mixing time over 50%*

✔ *always produces a superior mix*

DAY TWIN MOTION PONY MIXER

In recent field tests this new Day Mixer produced a superior mix in only 15 minutes, as compared to 35 minutes, required by a Day Single Motion Mixer.

Here's why: twin spindles, with counter rotating, overlapping blades, operate at new higher speeds. Adjustable scraper blade at edge of rotating can, moves material into orbit of agitator blades, affecting counter current mixing and eliminating all "dead spots". This multiplicity of movements gives a homogeneity of mix that will meet your most exacting requirements. Product contamination is eliminated, as there are no stuffing boxes or bearings in product zone. All the rugged construction, meticulous engineering, that has made the Day Single Motion Mixer the leader, is built into this new Day Mixer. Working capacities of 3, 10, 25, 40, 50, 80, 100, 125 gal.

For complete information write for Bulletin I-502-PM.

FOUNDED 1887

in mixing equipment DAY *means longer life span*

THE J. H. DAY COMPANY

4932 BEECH ST., NORWOOD, CINCINNATI 12, OHIO
Division of Cleveland Automatic Machine Company

Quality equipment for baking, paint and varnish, printing ink, chemical, rubber, pharmaceutical, cosmetics, paper and pulp, explosives, food, ceramics, candy, soap, sugar and milk products.

Eastern Canada: Brantford Oven & Rock Co., Ltd., Brantford, Ontario
Mexico: T. de la Pena e Hijos, S.A., Nazas 45-A, Mexico 5 — D.F.

terials with the new magnetic filter of Magni-Power Co. (Wooster, O.). Ferrous particles are attracted by magnetically energized stainless steel prongs. The unit is cleaned by breaking the magnetic contact and removing the filter insert.

•

Granulator: Arthur Colton Co. (Detroit) offers its new Model 542 granulator with high-speed mechanical drive for granulating operations requiring the versatility of rotary and oscillating motions. When rotary motion is used, the rotor turns at 86 rpm.; when oscillating motion is used, the rotor revolves three-quarter turns in each direction at the rate of 86 reversals per minute. Colton recommends rotary motion for dry materials, oscillating motion for semiwet materials that tend to compact. Machine drive includes ¾-hp. motor.

•

Mixer-Unloader: The Type B continuous mixer and unloader made by The Allen-Sherman-Hoff Co. (Wynnewood, Pa.) is a new unit for removal and treatment of ash and other dry material. The unit is suspended from the base of a storage bin, controlled from ground level. A rotary feeder controls flow of fine material; adjustable baffle controls flow of larger-size feed. A single jet of water, impinging on splash plate, wets material as it enters mixing drum; baffles in the drum insure thorough mixing before discharge.

•

Metal-Finishing Loader-Unloader: Rapid loading and unloading of automatic metal-finishing machines may now be accomplished with Hanson-Van Winkle-Munning Co.'s (Matawan, N.J.) new automatic transfer unit. Designed to shuttle on a pair of rails between metal-finishing machine and monorail conveyor, the unit loads and unloads work racks on the same indexing sequence as the finishing machine, permits work to flow to and from the finishing machine on the monorail without mixing unfinished and finished work.

•

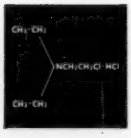
Gas Dryers: Kahn and Co., Inc. (Hartford, Conn.) now makes a new series of low-pressure-adsorption gas dryers for atmosphere control in the metallurgical industry, inert gas generators, purging refrigeration components, etc. Units are completely

specially prepared

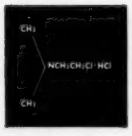
INDIVIDUALIZED INTERMEDIATES

DIALKYL AMINO ALKYL CHLORIDES provide a versatile group of intermediates for pharmaceutical synthesis. Continuously produced by Michigan Chemical Corporation for many years, individual members of this intermediates family provide manufacturers with a convenient method for introducing the dialkyl amino alkyl radical into organic nuclei to produce substituted amines, esters, and ethers. All are available in commercial quantities. Write for samples, technical data, and prices.

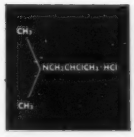
for pharmaceutical synthesis



beta-Diethylaminoethyl Chloride Hydrochloride. (DEC). $(CH_3CH_2)_2\ NCH_2CH_2Cl.\ HCl$. A granular solid. Specially suited for use as an intermediate in organic chemical manufacture, including the production of antispasmodic agents and other pharmaceuticals.



beta-Dimethylaminoethyl Chloride Hydrochloride. (DMC). $(CH_3)_2\ NCH_2CH_2Cl.\ HCl$. A granular solid. Specially prepared for use in manufacture of antihistaminics and other pharmaceuticals. Other potential uses in organic synthesis. Relatively non-toxic in hydrochloride form.



beta Dimethylaminoisopropyl Chloride Hydrochloride. $(CH_3)_2\ NCH_2CHClCH_3.\ HCl$. (DMIC). An organic intermediate similar in appearance and properties to DEC and DMC. Specially prepared for manufacture of analgesics and other pharmaceuticals. Other potential uses in organic synthesis.

gamma - Dimethylaminopropyl Chloride Hydrochloride. $(CH_3)_2\ NCH_2CH_2CH_2Cl.\ HCl$. (DMPC). A white powder of singular purity. A versatile intermediate for pharmaceutical and organic syntheses, available exclusively from Michigan Chemical.

Other widely used intermediates supplied by Michigan Chemical Corporation include Hydrobromic Acid, Methyl Bromide, Ethyl Bromide, Monobromobenzene, Trimethylene Chlorobromide, Phosphorous Tribromide and Cyclopentyl Bromide. Write for booklet "Individualized Intermediates."

MICHIGAN CHEMICAL CORPORATION

*Trademark

504 Bankson Street, Saint Louis, Michigan

C-55-1

EASTERN SALES OFFICE: 230 Park Avenue, New York 17, New York

BASIC MANUFACTURER OF INDUSTRIAL, PHARMACEUTICAL AND AGRICULTURAL CHEMICALS

TANTALUM... We recommend it only when it is the cheapest material AVAILABLE

Tantalum is seldom cheaper on a "per-pound" basis. But tantalum is quite often the "cheapest" material when judged on an over-all final operating cost basis, on a product purity basis, on a freedom from maintenance or an elimination of down-time basis.

We don't expect anyone to take tantalum on faith or generalities. But if you process hydrochloric acid, nitric acid, perchloric acid, bromine, iodine, hydrogen peroxide, sulfuric acid, chlorine, chlorine dioxide (and many other corrosives), tantalum may save you money. Fansteel engineers can tell you, definitely, whether or not tantalum will be "cheapest" for you.

USE TANTALUM WITH ECONOMY for most acid solutions and corrosive gases or vapors.

Not recommended for HF, strong alkalis or substances containing free SO_3.

Write for free TANTALUM booklet today!

FANSTEEL METALLURGICAL CORPORATION
Chemical Equipment Division
NORTH CHICAGO, ILLINOIS, U.S.A.

G563A

PRODUCTION

automatic, have twin adsorption towers, assure continuous flow of dry gas at dew points of minus 50 F or lower. Explosionproof construction is available for hydrogen service.

•

Computing Telemetering System: A new telemetering system that will totalize flow measurements and make corrections has been announced by The Bristol Co. (Waterbury, Conn.). The system, made up of telemetering transmitters and receivers, and electronic self-balancing instruments, can be supplied for averaging, totalizing, multiplying and dividing computations involving measured variables such as temperature, pressure, specific gravity and supercompressibility of fluids. The system is built to fit a specific set of requirements, can be made to compensate for particular mathematical laws, including those involving squares and square roots.

•

Direct-Writing Oscillograph: Consolidated Electrodynamics Corp. (Pasadena, Calif.) claims its new, two-channel, direct-writing oscillograph with companion amplifier has greater flexibility than other similar instruments. The unit consists of a Type 5-301 Datagraph and a Type 1-133 Amplifier, provides instantaneous, permanent recordings of frequencies up to 250 cycles/second at 1-in. double amplitude. Datagraph has square-wave and transient response, also. The recorder uses no ink, has a vibrating wire in a magnetic field that burns a mark onto electrosensitive paper. Push-buttons may be used to select six chart speeds from 0.05 to 20 in./second. Control knobs set the trace density for each channel; automatic timing pulses at 1 to 5 pulses/second are provided by external means.

•

Shutoff Valves: Automatic Switch Co. (Orange, N.J.) offers a new, safety shutoff valve designed to control the flow of natural, manufactured and L-P gases, fuel oil, and other noncorrosive liquids and gases. A manual-reset solenoid valve, it is made specifically for automatic fuel supply cutoff to heating equipment on power-failure. Sizes from ¾ to 6 in. are available; maximum ambient temperature for fluid is 104 F, pressure range is 25 to 100 psi.

EXPLORING NEW TERRITORY?

For synthesis—
Hydroxylamine salts may be used to make oximes, hydroxamic acids, and numerous intermediates. They are useful for preparation of anti-skinning agents, anti-rusting agents, and pharmaceuticals.

As acid-stable reducing agents— For metallic ions such as ferric, cupric, silver, and for nonmetallics such as dyes, peroxides, and nitrites. These compounds are useful in purification processes, dyeing of acrylic fibers and as a short-stopper for catalyzed polymerization reactions.

As oxidizing agents—
This is new territory that needs exploring. Hydroxylamine salts are probably mild oxidizing agents.

Effects on proteins and biological systems—
Hydroxylamine salts inhibit enzymes such as catalase, harden gelatine . . . derivatives are good fungicides and bactericides. For the most part, this is a poorly explored area suitable for intensive experimentation.

***Hydroxylammonium Acid Sulfate**
$NH_2OH \cdot H_2SO_4$
Hydroxylammonium Sulfate
$(NH_2OH)_2 \cdot H_2SO_4$
Hydroxylammonium Chloride
$NH_2OH \cdot HCl$

Already known for their wide range of utility, these nitroparaffin derivatives may find dramatic uses from future research. Their potential applications for experimentation are almost unlimited.

For more details on these and other uses for Hydroxylamine salts, mail the coupon below.

COMMERCIAL SOLVENTS CORPORATION
Industrial Chemicals Department • 260 Madison Ave. • New York 16, N. Y.

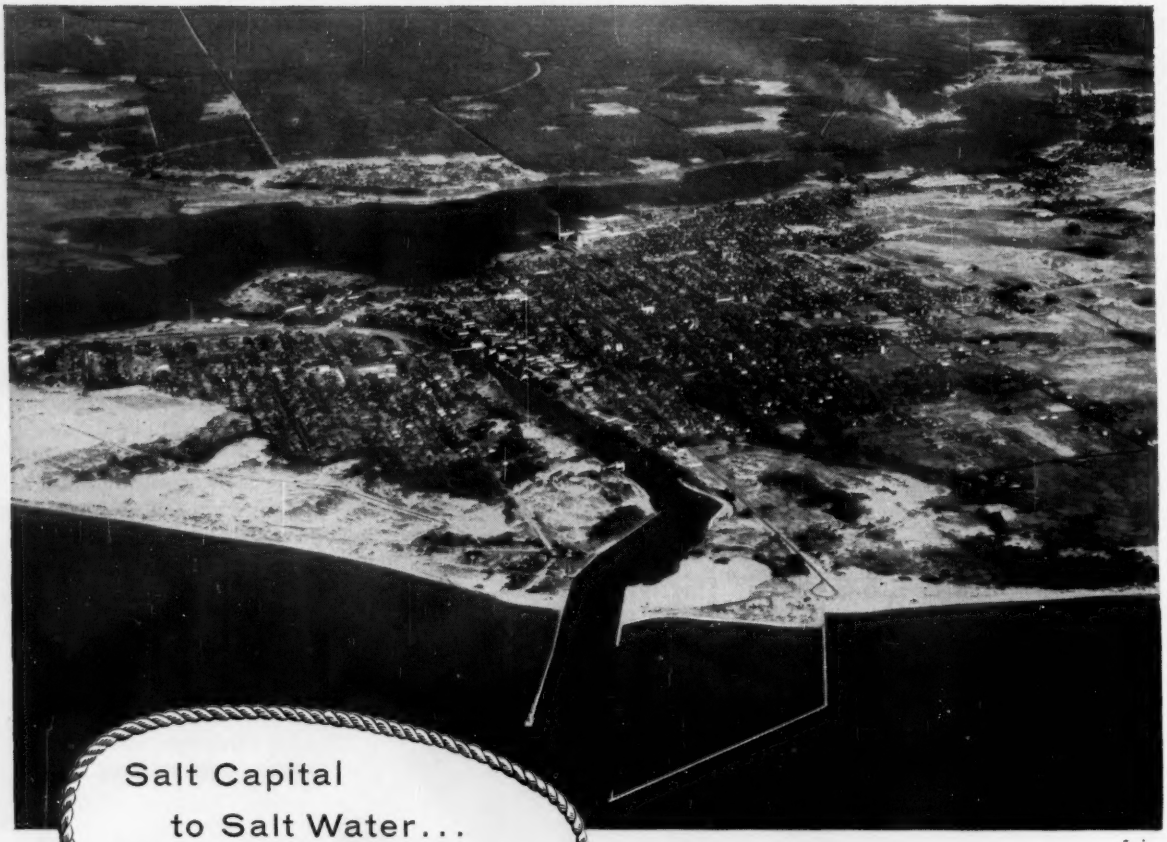
Please send me data sheets #19 and #19A for information on Hydroxylamine salts.

Name_____ Title_____

Company_____

Street_____

City_____ Zone_____ State_____



Salt Capital
to Salt Water...
MANISTEE to the Sea!

MANISTEE, MICHIGAN

Manistee is one of several excellent deepwater ports on the Great Lakes-St. Lawrence waterway in Outstate Michigan.* Known as the "salt capital" it bears the name of a famous trout stream which flows into its harbor.

The protected harbor, Lake Manistee, is connected to Lake Michigan by a 3,600-foot channel 300 feet wide. Ships can sail from Manistee via the waterway to any port on the seven seas.

Manistee is a city of 10,000 with many times that number within easy driving distance. Widely known hunting, fishing and resort areas are close by, and the beautiful Manistee National Forest is the city's playground.

Besides common salt, Manistee produces industrial chemicals, insulating box board papers, machine tools, clothing, shoes, drop forgings, furniture, pleasure boats and core sand. Chemical brines high in magnesium and calcium chloride underlie Manistee and form the basis for important industrial chemical production.

Manistee is an ideal site for an industry or a branch plant. It is a good port city in Outstate Michigan's splendid vacationland where industry thrives and people really enjoy living.

Outstanding industrial sites are available. For further information contact our Industrial Development Department.

**Others are Bay City, Saginaw and Cheboygan on the Lake Huron side, and Muskegon, Manistee, Frankfort, Traverse City, East Jordan and Boyne City on the Lake Michigan side.*

CONSUMERS POWER COMPANY
JACKSON, MICHIGAN

Serving 3,500,000
Outstate Michigan People

Technology
Newsletter

CHEMICAL WEEK
August 18, 1956

Jones and Loughlin last week decided to take a step that may have wide ramifications for producers and users of aromatics. It decided to put in a $2-million unit at its Aliquippa (Pa.) plant to remove sulfur from the aromatic (benzene, toluene, xylene) stream by a special treatment with hydrogen.

Facilities will be engineered and built by Badger Manufacturing, which will put Esso's hydrofining process to work in removing the sulfur.

And that isn't all. U. S. Steel will put up a similar unit at its Clairton, Pa., works, site of the world's largest operations in the field of coke-oven-derived chemicals. The plant will be engineered and built by Koppers, which will utilize the German-developed Scholven Chemie light oil catalytic refining process. Koppers acquired rights to it earlier this year (*CW Technology Newsletter, Jan. 7*).

Neither Koppers nor U. S. Steel is talking size, will say only that it's a multimillion-dollar unit. Construction is due to start this fall; completion target is late next year. (Construction on the J&L plant will get under way this month for completion early next year.)

Meanwhile, Blaw-Knox has quietly acquired rights to the same process, and is now actively hunting customers. It calls its method the Blaw-Knox modification of the Lurgi hydrogenation process.

Reason for all the activity: Coke-oven benzene makers are being forced to meet the specifications of petroleum benzene. Manufacture of adipic acid for nylon is a case in point. Coke-oven benzene is being ruled out here because of requirements that the benzene contain no more than 1 part per million of sulfur.

The idea in hydrogen refining is to convert the sulfur into hydrogen sulfide, then to extract the paraffins in a Udex unit. The aromatics are separated by fractional distillation. Benzene produced in that manner contains less than 1 ppm. of sulfur, has a solidification point of 5.4 C, making it equivalent to petroleum-derived material. And, as U. S. Steel points out, the switch to hydrogen refining eliminates the problem of acid sludge disposal.

•

Kennecott Copper has obtained rights to the electrolytic zirconium-hafnium process developed by Horizons and will build a test plant in the Cleveland area to explore it. The agreement with Horizons gives Kennecott options on the process as adapted to other metals, including titanium, thorium, columbium and tantalum. Its interest in titanium processing has hitherto been on a thermal dissociation of the tetra-iodide (*see p. 58*).

•

Spencer Chemical is bringing out a new "high-density" polyethylene made by its own modification of the ICI high-pressure process. Actually, the material will have a density of 0.935-0.940, or intermediate between conventional polyethylene and the high-density product of the new low-pressure process.

From the product standpoint, it appears to be competitive with the high-density material that ICI itself introduced recently. Spencer, however, points out that it is the first company to have such a product available in commercial quantities. It is also understandably proud of the fact that, although a relative newcomer to the field of polyethylene, it has made a significant contribution to the high-pressure process.

•

Carbide and Carbon is switching its $11-million coal hydrogenation pilot plant at Institute, W. Va., over to the manufacture of other chemicals. Coal hydrogenation pilot operations will be switched to a new small installation capable of treating 12 tons/day of coal. The new unit, Carbide figures, will be a lot more flexible than the bigger, older one.

•

One way to cut construction time is to buy an existing building, then add the necessary processing equipment. That's presumably what National Distillers plans for its zirconium plant in Ashtabula—it has purchased the Lake City Malleable foundry (close to its sodium plant there) for $869,820.

National Distillers is still not commenting on the purchase, but it now seems certain that the firm expects to pare several months from its zirconium plant building schedule by utilizing the Lake City facilities as the plant shell.

•

It will be some time before the causes of the explosion at the Olin Mathieson plant in Niagara Falls (*CW Business Newsletter, Aug. 11*) are clearly delineated. But people close to the blast report there were two distinct explosions. Plant Superintendent John Holland said that the first blast could have been caused by "experimental work in the electrolysis of hydrochloric acid."

•

Two developments last week will have wide repercussions in cancer chemotherapy:

• Wendell M. Stanley, Nobel prize winner and head of University of California's virus research laboratory, reported that work in his lab indicates strong support for the theory that cancer is caused by a virus. "I believe the time has come," he said, "when we should assume that viruses are responsible for most, if not all, kinds of cancer."

• A new test for cancer was proposed by Dean Burk, of the National Cancer Institute, and Arthur Shade, of the National Microbiological Institute. Writing in *Science*, they suggest that the amount of oxygen consumed would indicate whether or not a cell is cancerous. This test would be based on the work of Otto Warburg, the German physiologist who earlier this year reported that cancerous cells do not metabolize as normal cells do, and that they use less oxygen in respiration than do healthy cells.

Koroseal pipe carries corrosive solution powerful enough to etch steel

THIS paper mill speeded up flow of corrosive sodium hypochlorite bleach to its pulp beaters by installing high impact rigid Koroseal pipe lines. This modern anti-corrosive system eliminates a time-consuming hand measuring operation. Perhaps the corrosion problems you have can also be solved by B. F. Goodrich high impact PVC pipe. In addition to handling corrosives safely, Koroseal pipe has the strength to take a beating.

Koroseal pipe is unaffected by most acids and alkalies as well as oil, water, alcohol and salt solutions. Many solutions that eat away metal piping can be safely carried by Koroseal.

Easy to use with Koroseal fittings and valves, this rigid pipe can be threaded on any standard pipe threading equipment.

Koroseal pipe is available in various pressure schedules. Koroseal PVC comes in pipe, tubing, fittings, valves, rod, sheet and custom extrusions.

For full information on rigid Koroseal products fill in the handy coupon. Distributorships for certain areas are still open. Inquiries invited. *B. F. Goodrich Industrial Products Company, Marietta, Ohio.*

The B. F. Goodrich Company
Dept. K-79
Marietta, Ohio

Please send me free booklets on:

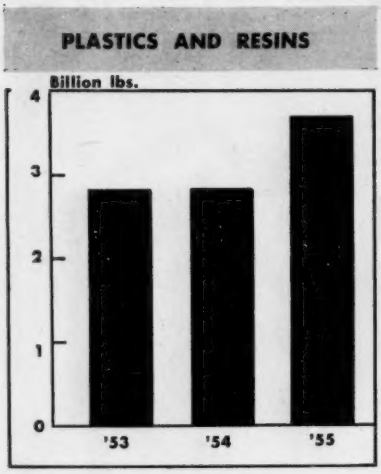
☐ Rigid Koroseal Pipe
☐ Rigid Koroseal Sheet

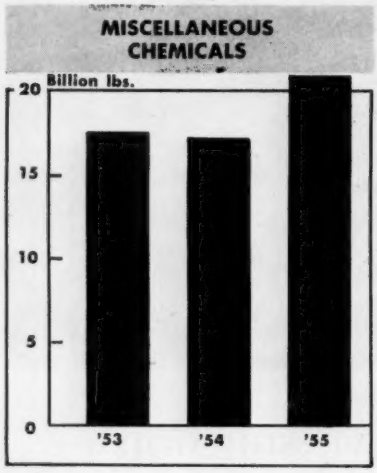
Name _____

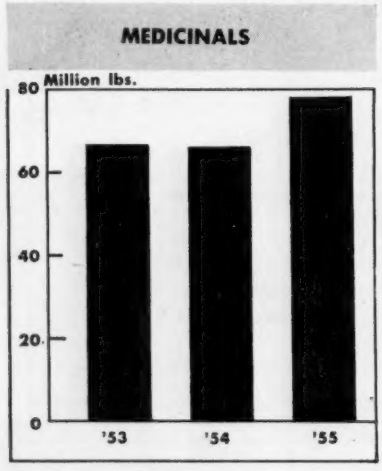
Company _____

Address _____

City _____ **Zone** ____ **State** _____







Final Organic Rundowns Underscore '55 Gains

Out now are three new U.S. Tariff Commission reports—last in the series of 14*—giving preliminary statistics on production and sales of synthetic organic chemicals in '55. Covered: synthetic plastics and resin materials; miscellaneous synthetic organics; medicinals.

The agency's statistics revealed that last year's output and use of materials in the plastics category and in medicinals were the largest on record, while the miscellaneous group scored impressive gains over '54's.

Plastics Up: Production last year of all noncellulosic synthetic plastics and resin materials totaled more than 3.7 billion lbs., nearly a third greater than the 2.8 billion reported in '54. Sales in '55 were a shade over 3.2 billion lbs., valued at $1.1 billion, compared with the nearly 2.5 billion lbs. ($856 million worth) in the previous year. Production of cellulose plastics during '55 was 145 million lbs.

Last year, as in '54, output of vinyl and vinyl copolymer resins was tops among resins. Production hit 703 million lbs., 34% more than the 524 million produced in '54. Sales of vinyl resins in '55 came to 664 million lbs., worth $254 million. Second to vinyls in volume of production were styrene resins with 619 million lbs. Sales were 572 million lbs., valued at $181 million.

Output of polyester resins during the year, chiefly for low-pressure laminating, amounted to some 62 million lbs., a hefty 13 million above production in '54. And not surprising is the inclusion of polyethylene statistics in the report for the first time. U.S. output of polyethylene resins in '55 jumped to 402 million lbs., while sales, as had been anticipated by most marketers, touched the 350-million-lb. mark. Value: $138 million.

Phenolic and other tar resins racked up a production score of 563 million lbs.—a 30% increase from '54's 434 million—and shipments last year, with a value of $127 million, totaled close to 483 million lbs.

Production of urea and melamine resins in '55 was 328 million lbs., considerably under the previous year's 265 million; sales ($92 million worth) amounted to about 300 million lbs.

Production of all alkyd resins (used principally as protective coatings) amounted to 543 million lbs., and though no details are given, acrylic and polyamide resins were reportedly produced in "large quantities" during '55.

Miscellaneous Climb: The Tariff Commission puts total U.S. production of miscellaneous (cyclic and acyclic) chemicals at nearly 20.8 billion lbs., some 19% higher than '54's 17.4 billion. Sales: slightly above 9.6 billion lbs. ($1.4 billion) during '55, compared with 8.1 billion lbs. and $1.2 billion in the previous year.

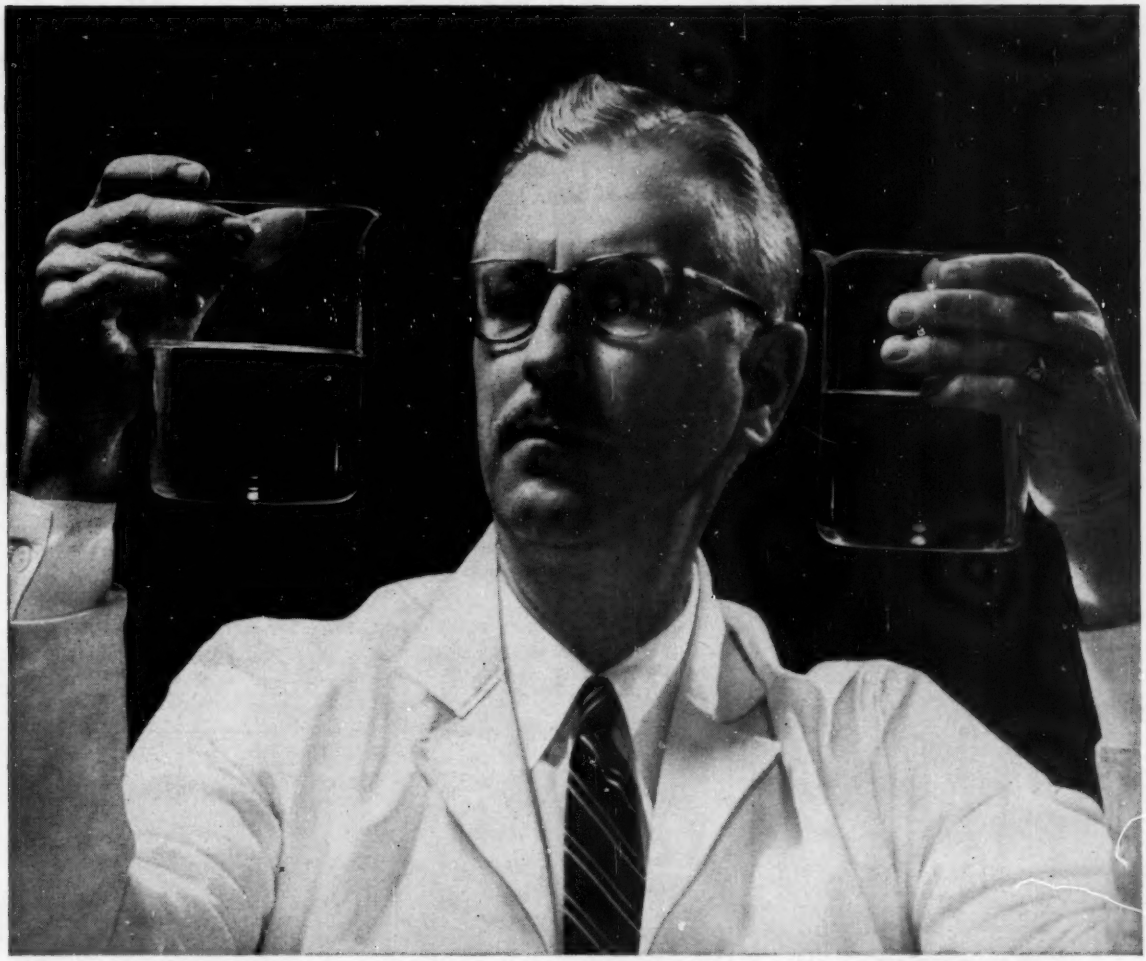
In the acyclic column of the miscellaneous chemicals, including halogenated hydrocarbons, acetic acid and anhydride, ethylene glycol, formaldehyde, and methyl, ethyl and isopropyl alcohols, production total comes to almost 20.3 billion lbs.—19% more than the 17.0 billion reported in '54. Shipments of all acyclic miscellaneous chemicals last year amounted to 9.3 billion lbs., worth approximately $1.3 billion. The '54 sales figures: about 7.8 billion lbs. and $1.1 billion.

Cyclic group items, including such products as hexamethylenetetramine, naphthenates, photographic chemicals, lubrication oil additives, and tanning materials, were turned out at a 513-million-lbs./year rate last year, more than 100 million lbs. greater than the '54 tally. Total cyclic sales comparison: in '55, 312 million lbs. ($105 million); in '54, 255 million lbs. ($77 million).

Medicinal Peak: Medicinals achieved an all-time high last year, jumped 13 million lbs. in production and 16

*For a roundup report on the preceding 11, see *CW*, Aug. 4, p. 112.

DOW



Glycerine...clear as water for lighter resins!

The lab expert has to look twice to tell the difference between plain water and water-clear Dow glycerine! It's this outstanding clarity indicating high over-all quality—which will give you better, lighter-colored alkyd resins in your paints.

Other advantages, too. Stability of supply, for instance. You will find Dow glycerine readily available—and on a stable *price* basis.

Then there's the important consideration of high yields which you'll get consistently from Dow glycerine.

Send for the new Dow glycerine booklet right away which explains these benefits in more complete detail. You'll find it worth the small effort—many, many times over! THE DOW CHEMICAL COMPANY, Midland, Michigan, Department OC 840B-1.

you can depend on DOW CHEMICALS DOW

million lbs. in sales, compared with the amounts reported by the commission in '54. The '55 output is put at 79 million lbs.; sales were 69 million lbs., valued at $465 million, some $39 million above the amount realized on the 53 million lbs. sold in '54.

But not all segments of the category, the commission notes, registered increases in production and sales. Take antibiotics for medicinal purposes, for example. Total output last year was 1.6 million lbs.—a 265,000-lb. drop from the '54 level; yet sales were 1.4 million lbs., valued at $242 million—up 100,000 lbs. and $2 million from '54.

Production of penicillin salts dropped sharply from 477 trillion International units in '54 to 344 trillion last year. And outputs of dihydrostreptomycin and streptomycin were 369,000 lbs. and 154,000 lbs., respectively, in '55.

Last year's production of all other medicinal antibiotics (e.g., chlorotetracycline, chloroamphenicol and oxytetracycline) totaled 570,000 lbs.; sales were 480,000 lbs., valued at $172 million.

Data on nonmedicinal antibiotics (for animal feed supplements) show '55 production was 520,000 lbs., while sales were 553,000 lbs ($26 million).

Barbituric acid derivatives rose to 864,000 lbs., from 798,000 in '54, while aspirin (acetylsalicylic acid) moved up from 13.9 million lbs. to '55's 15.1 million. On the other hand, production of sulfa drugs slipped badly—from 4.2 million lbs. in '54 to 1.4 million last year.

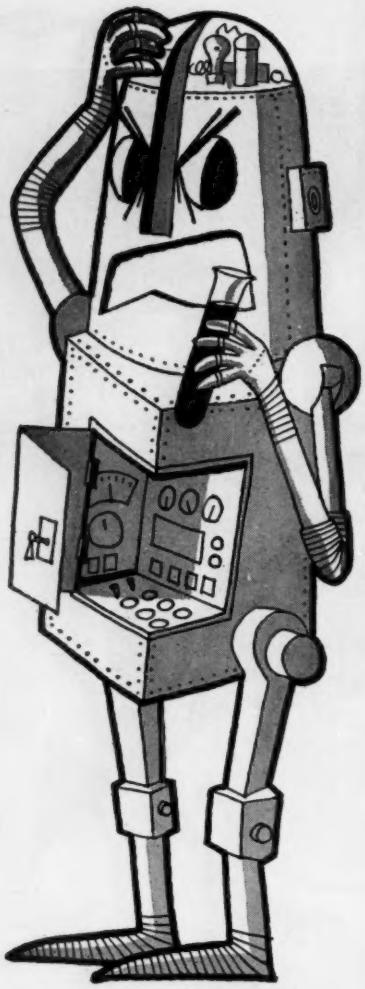
(Incidentally, antibiotics appear to be faring better in '56 than they did last year. For instance, in January through May this year, these were the production increases over the similar period in '55: penicillin, 13%; streptomycin, 20%; dihydrostreptomycin, 27%. Also, penicillin exports in the same 5 months were up 47%.)

Production of all vitamins during

Polyethylene Rolls Up

GENERAL POLYETHYLENE resin consumption—now bouncing along at 350-400 million lbs./year—gives little indication of soon slowing down. And contributing to the upsurge is use in comparatively new resin-coated fabrics.

One of the latest in this category is the portable "garage" (*above*). Cotton is coated with Du Pont's Alathon polyethylene resin (4.29 lbs. for each Rolla-Cloth garage) by Cotswold Fibres for Budge Mfg. Co.; this use is expected to take some 214,000 lbs. of resin next year.



Cure
for Waste
"Indigestion"

. . . Jacques Wolf *Enzymes*

Jacques Wolf specific action enzymes insure rapid and complete liquefaction of waste materials. They get right to work and stay on the job until wastes are liquefied and drained off. Yes, Jacques Wolf enzymes actually "digest" wastes and flow them away!

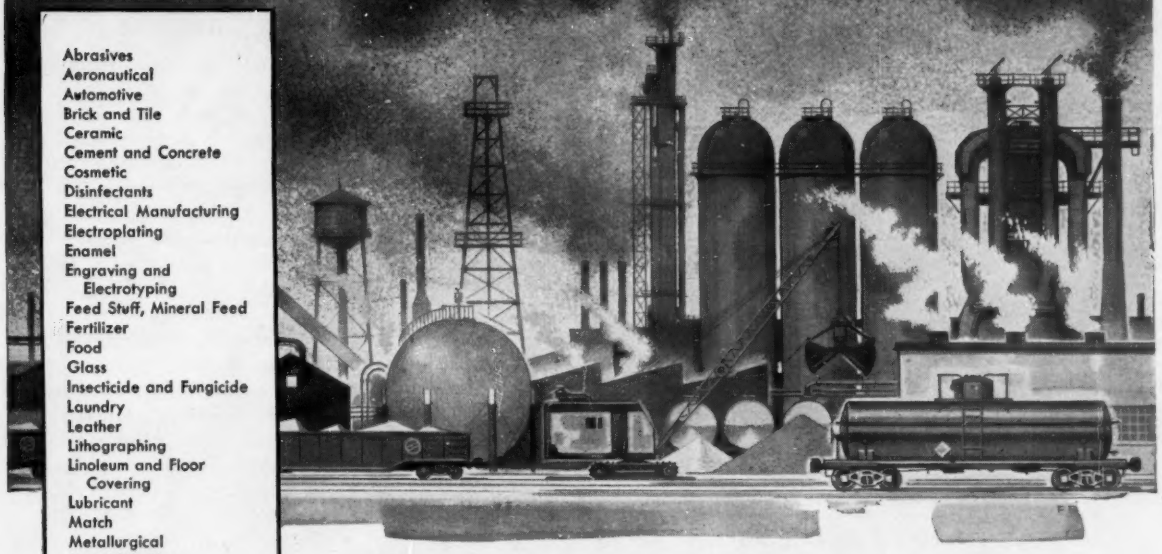
Ideal for septic tanks, cesspools and sewers, they're highly concentrated to do a better, more effective job in less time.

Samples for testing are available; contact us today.

JACQUES WOLF & CO.
Chemicals PASSAIC, N.J.

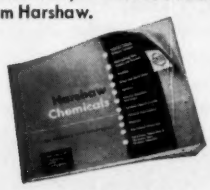
Plants in: Clifton, N.J., Carlstadt, N.J., Los Angeles, Calif.

IS YOUR INDUSTRY LISTED HERE?



- Abrasives
- Aeronautical
- Automotive
- Brick and Tile
- Ceramic
- Cement and Concrete
- Cosmetic
- Disinfectants
- Electrical Manufacturing
- Electroplating
- Enamel
- Engraving and Electrotyping
- Feed Stuff, Mineral Feed
- Fertilizer
- Food
- Glass
- Insecticide and Fungicide
- Laundry
- Leather
- Lithographing
- Linoleum and Floor Covering
- Lubricant
- Match
- Metallurgical
- Metal Working
- Oil Cloth
- Optical
- Paint, Varnish and Lacquer
- Paper
- Petroleum
- Pharmaceutical
- Photographic
- Porcelain Enamel
- Plastics
- Pottery
- Printing Ink
- Pyrotechnic
- Refractories
- Rubber
- Shade Cloth
- Soaps
- Textile
- Veterinary Remedies
- Welding Electrodes
- Wall Paper

FREE! This 16-page booklet lists the many chemicals available from Harshaw.



WRITE TODAY FOR YOUR COPY

HARSHAW CAN SERVE YOU!

Harshaw sells chemicals — thousands of them — for these and many other industries

Here are typical Harshaw chemical products

- Electroplating Salts, Anodes and Processes
- Organic and Inorganic Dry Colors and Dispersions
- Driers and Metal Soaps
- Vinyl Stabilizers
- Ceramic Opacifiers and Colors
- Fluorides
- Glycerine
- Preformed Catalysts, Catalytic Chemicals
- Synthetic Optical Crystals
- Agricultural Chemicals
- Fungicides
- Chemical Commodities

THE HARSHAW CHEMICAL CO.

1945 EAST 97th STREET • CLEVELAND 6, OHIO

Chicago • Cincinnati • Cleveland • Hastings-On-Hudson, N.Y. • Houston • Los Angeles
Detroit • Philadelphia • Pittsburgh

Announcing...

a new plant for the production of

VANCORAM CHEMICALS

Increasing demand for Vancoram Ammonium Metavanadate, Vanadium Pentoxide, Sodium Orthovanadate and Vanadium Chloride as well as other chemicals of Vanadium has necessitated expansion of our production capacity.

These new facilities which are located within VCA's Research Center at Cambridge, Ohio, bring together the modern equipment and close technical supervision necessary to insure the high quality standards for which Vancoram Chemicals are noted.

Vancoram vanadium chemicals find increasing use in the production of heavy organic chemicals, in petroleum refining and in the manufacture of numerous organic chemical products including synthetic fibers and plastics.

Our technical representatives will be glad to talk over any application problems you may have. Just call your nearest Vanadium Corporation office.

VANADIUM CORPORATION OF AMERICA

420 Lexington Avenue, New York 17, N.Y.

Pittsburgh • Chicago • Detroit • Cleveland

Producers of alloys, metals and chemicals

1906 - 1956

'55 was close to 6.1 million lbs.; sales, 5.1 million, with a near-$83 million value.

Industry-wide, there's a clear ring of good tiding in these statistics on production and sales, even though they're preliminary and not all-inclusive. The Tariff Commission's final report later this year will have the complete data.

Tannin Tumbles

South America's tannin industry is in rough straits—and chances are its plight will become more desperate before the year is out. Argentina, for example, with a quebracho extract production capacity of nearly 300,000 tons/year, expects to produce only 145,000 tons this year. Why? World markets for tannin appear to be petering out.

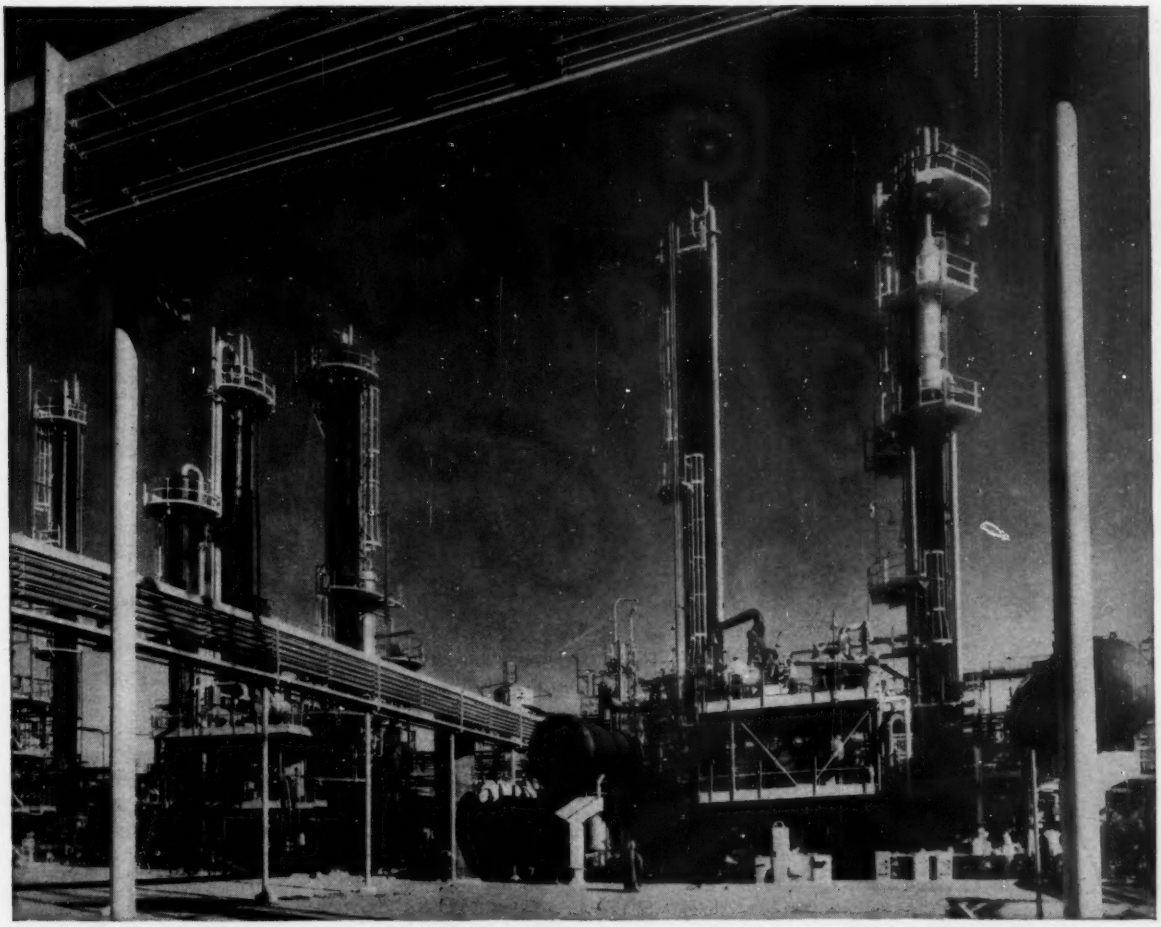
In fact, reports from Argentina indicate that even current production of the commodity exceeds world demand. And such need continues to be buffeted by several comparatively recent developments:

- Inroads by various synthetics into once-traditional outlets held by leather, the chief tannin consumer.
- The growing tendency to mix quebracho extract with tannin agents from mimosa and chestnut woods.
- Increased use of synthetic tannin agents.

Quebracho extract consumption has become so acutely affected by these factors that at least five Argentine tannin establishments have been forced to shelve operations within recent months. This has led the workers' groups to press for the formation of a national commission to investigate world demand for tannin and recommend steps to be taken for the "preservation of this industry."

These groups blame the closing of the Argentine plants on an "international maneuver" to replace quebracho-extracted tannin with a South African product extracted from the mimosa tree at a lower cost.

Comparison of the sales of quebracho and mimosa extracts shows that in the last three years, 1953-55, world consumption of the former averaged 190,000 tons/year, while mimosa use averaged 138,000 tons/year. The figures underline the tilting mimosa-quebracho balance since pre-World War II, when quebracho sales aver-



EAST'S NEWEST PLANT FOR PHENOL PRODUCTION

Now in its second year on stream at Gibbstown, New Jersey, the East's newest phenol plant has already become one of the leading sources of supply. Here Hercules produces high-quality U.S.P. synthetic phenol by the cumene oxidation process.

Prompt shipment in tank cars, tank trucks or drums from this modern plant is available. You may save time and labor if you explore the economy in receiving phenol by tank truck in molten form. Let us discuss this service with you.

HERCULES

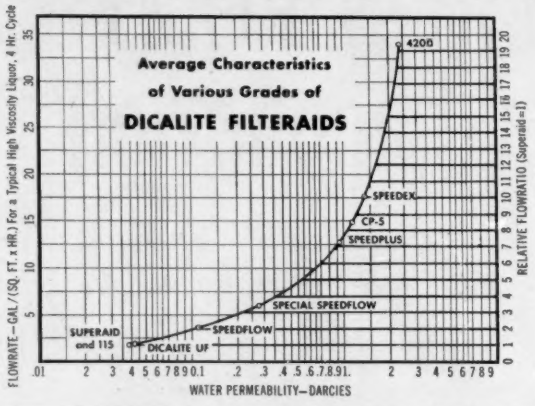
Oxychemicals Division
Naval Stores Department
HERCULES POWDER COMPANY
INCORPORATED
992 Market Street, Wilmington 99, Del.

N056-3

. . . is easy with

DICALITE FILTERAIDS!

. . . it's easy because the various grades of Dicalite filteraids afford such a wide range of filter throughput. When the output of your filter station matches production demands, you have no worries. But when sudden peak demands call for a sharp increase in filter output, you can use one of the four ways discussed in the column at the left—keeping in mind the flowrate range of the various Dicalite grades shown on the chart below. Again, should your process liquor vary in filterability from one day to another (as happens in many industries), you can maintain both quality and production either by varying the amounts of Dicalite fed to the filter, or by the use of another grade of Dicalite. One way or the other, you'll always have the right combination when you filter with Dicalite.



Dependable GLC GREAT LAKES Dicalite® DIATOMACEOUS MATERIALS

DICALITE DIVISION • GREAT LAKES CARBON CORPORATION
612 SOUTH FLOWER ST., LOS ANGELES 17, CALIFORNIA

aged 220,000 tons/year and mimosa extract averaged 80,000 tons/year.

Supply Plentiful: Sources of quebracho are virtually unlimited. A census by the Argentine-Paraguayan Assn. of Quebracho Extract Producers shows that as recently as 1950, Argentina had standing forests of some 106.5 million tons of quebracho wood, enough to keep the extract industry going for 120 years at its present rate—and this without any reforestation.

World demand for vegetable tanning agents, including extracts of quebracho, mimosa and chestnut wood, has fluctuated between 400,000 and 500,000 tons/year over the past two decades. The peak in this period was reached in '51, when total sales bounced to about 510,000 tons. High spots for quebracho alone occurred in '39, '46 and '51—290,000 tons in each year.

In '56, quebracho extract producers expect to sell about 175,000 tons, less than the average in the last three years. Of these sales, approximately 30,000 tons will be Paraguayan exports; 125,000 tons, Argentine exports; and 20,000 tons will go to Argentine domestic consumption.

But there's a chance that South America's quebracho extract capacity may yet be more fully utilized. Argentine producers, at a recent world congress of manufacturers of vegetable tannin agents in Paris, formulated a program to increase the use of their products. One likely potent prop for their wobbling industry: an intensive publicity campaign to promote the advantages of using the tannin's major consumer, leather.

C W Report

Next Week

A prominent management consultant tells how to organize your company to meet tomorrow's competition.

MINES

at Carlsbad—the raw material

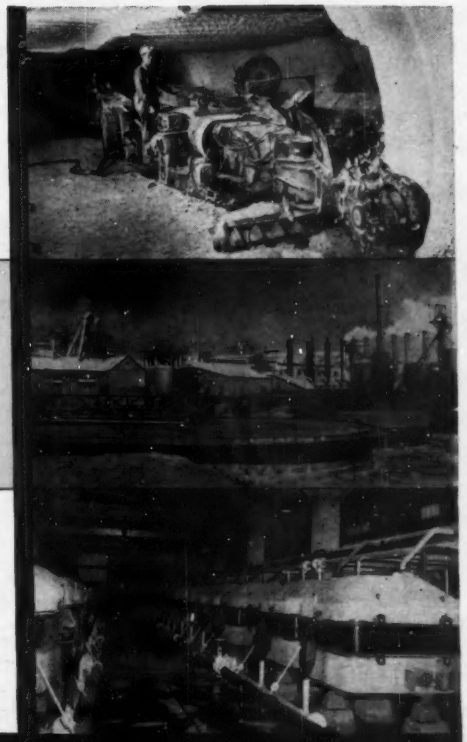
(sylvite ore) KCl and NaCl

REFINES

at Carlsbad—potassium chloride KCl

MANUFACTURES

at Niagara Falls—carbonate of potash K_2CO_3



THERE'S ONLY **ONE** BASIC PRODUCER OF

CARBONATE OF POTASH

INTERNATIONAL MINERALS & CHEMICAL CORPORATION

What's the advantage to you in buying from a basic producer? Greater security of supply. Consistently uniform quality. High purities. Prompt shipments on schedule.

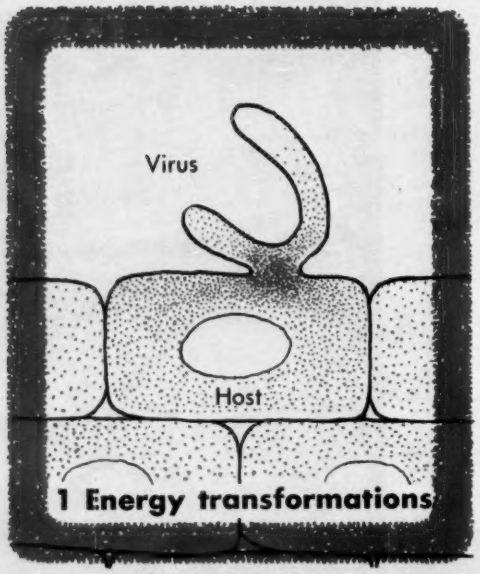
International, alone among suppliers of Carbonate of Potash, is a *basic producer*, controlling production from ore bed to finished product. From sylvite ore mined at the 900 ft. level, the Carlsbad refinery produces electrolytic grade KCl. This 99.95+% pure material is shipped to the Niagara Falls plant for the manufacture of K_2CO_3 and other potash salts.

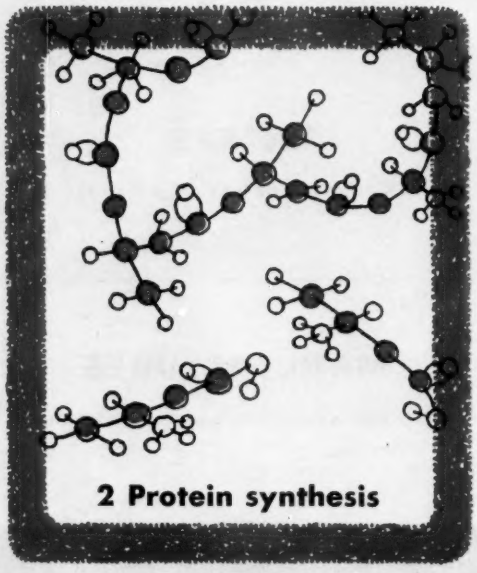
CAUSTIC POTASH
CARBONATE OF POTASH
POTASSIUM CHLORIDE
SULFATE OF POTASH
HYDROFLUOSILICIC ACID
MAGNESIUM OXIDE
LIQUID CHLORINE
MURIATIC ACID

potash division International Minerals & Chemicals

INTERNATIONAL MINERALS & CHEMICAL CORPORATION • GENERAL OFFICES: 20 NORTH WACKER DRIVE, CHICAGO 6
61 BROADWAY, NEW YORK 6 • MIDLAND, TEXAS • FULTON NATIONAL BANK BLDG., ATLANTA, GA.

Viruses are vulnerable to chemicals that





Search for Virus Drugs Takes

Researchers in the field of virus chemotherapy seem to be compounding their confusion. Although they have a pretty good idea of how to get at their targets (*see illustration*), they have not yet come up with a single chemical that indisputably cures* a virus disease. Yet even now they are setting out in search of broad-spectrum antiviral agents—single chemicals that cure several different diseases.

Get up close to these enthusiastic people and you find that the idea is not so illogical. Briefly, their argument runs like this: because of the large number of viruses—new ones are being discovered all the time—an equally large number of specific antivirus compounds would be needed to give broad protection. To complicate matters, diagnosis of virus diseases, identification of the causative virus, is slow and not very accurate.

The job of pinpointing all disease-causing viruses, then finding a chemical to combat each, they aver, is well nigh impossible. It's much more practical, they believe, to seek chemicals that inhibit several viruses at one blow. They further maintain that the probability of finding such agents is good.

Considerable encouragement for this viewpoint is being drawn from results reported† by Southern Research Institute's Frank Schabel, Jr. and Upjohn's Gerald Underwood. Their experiments have yielded new compounds that attack a broader range of viruses than do previously known agents. The new chemicals are not expected to prove clinically valuable. But by their mere existence, they are raising hopes of finding therapeutically useful broad-spectrum antivirals.

Schabel, head of SRI's chemotherapy section, screened 500-600 compounds for antiviral activity in animals, found only the thiosemicarbazones and 2,4-dichlorophenoxy thiouracil to have what he calls "unequivocal and reproducible" action against four test viruses—vaccinia, influenza, poliomyelitis, and Western equine encephalomyelitis.

Underwood, testing antivirals in eggs, turned up activity in a group of α-ketoaldehyde compounds—the structure of which can be varied widely, with retention of antiviral properties, so long as the terminal α-ketoaldehyde grouping is present. Kethoxal (β-ethoxy-α-ketobutyraldehyde), e.g., proved active against Newcastle virus, mumps, vaccinia, herpes simplex, influenza A and Western equine encephalitis.

Schabel feels that one antiviral compound is needed for each of these disease groups: pox diseases; upper respiratory infections (influenza, the common cold, acute undifferentiated respiratory diseases, Newscastle disease of fowl); so-called neurotropic virus disease (polio, various encephalitis viruses); and yellow fever, Rift Valley fever, and Dengue fever.

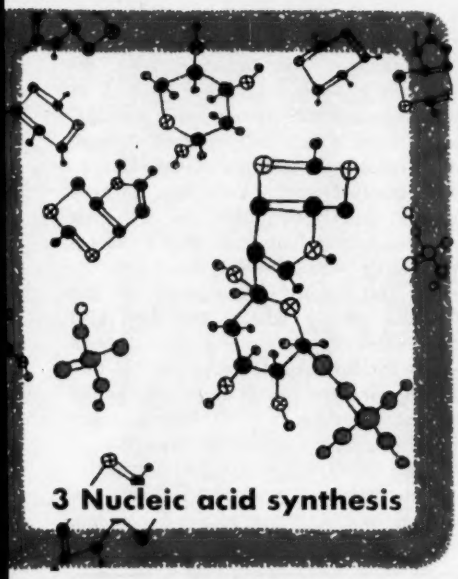
Of course he, and other virus researchers, would be happy to turn up a compound that controls even one of these diverse disease groups.

What makes the task difficult is the fact that viruses depend for survival

*Some antibiotics (e.g., sulfa drugs) are effective against so-called "larger viruses" (e.g., the psittacosis-lymphogranuloma group). True viruses may be defined as microorganisms that, in their smallest infective form, are less than 0.4 micron in diameter and that can multiply only within living cells of a susceptible host.

†At the recent 5th National Medicinal Chemistry Symposium sponsored at East Lansing, Mich., by the American Chemical Society division of medicinal chemistry.

interfere with . . .



1 ENERGY TRANSFORMATION—Viruses use their host cell's energy sources to grow and reproduce, can be thwarted by compounds that impede this energy transformation.

2 PROTEIN SYNTHESIS—Proteins are produced by viruses as part of their regular metabolic function. Chemicals that interfere with this process inhibit virus growth.

3 NUCLEIC ACID SYNTHESIS—Nucleic acids likewise are vital to a virus's well-being, are constantly being built up within the virus. Some chemicals can disrupt this process, too.

a New Turn

and multiplication upon metabolic mechanisms that are very similar to those of the host cells that they invade. The problem is to find a chemical that is more toxic to the virus than it is to the host.

Thousands of compounds have been tested for antiviral activity in scores of academic and industrial laboratories and really useful compounds are still in the offing. Known antiviral substances include antibiotics, polysaccharides, analogues of amino acids, dicarbonyls and related compounds, acridine compounds, analogues of nucleic acid constituents and benzimidazole derivatives.

Two Viewpoints: Chemical researchers feel that chemotherapy is the most effective potential answer to virus therapy. In defense of their position, they point to these shortcomings of vaccines: individuals must be vaccinated before contact with the virus occurs; vaccination must be repeated at frequent intervals (and this is rarely done voluntarily) to maintain immunity; and, because of the prohibitive number of inoculations required for any individual, it may be impractical to depend on vaccines for protection against all virus diseases.

Proponents of immunization via vaccines counter with the information that chemical agents must be administered 24-72 hours before infection to be effective. After infection, virus control with chemicals is more difficult. Some think that antiviral chemicals may see first use as prophylactic aids.

It may also be possible to develop vaccines that are effective for the life of the individual. (This is already possible in veterinary medicine.) And multiple vaccines (such as the influenza vaccine now in common use) may reduce the number of vaccinations required.

Dr. Carl Bunde, medical director of Pitman-Moore Co. division of Allied Laboratories, Inc. (Indianapolis, Ind.), explains that it is conceivable that a single injection may inoculate against many strains.

Pitman-Moore, a prominent vaccine-maker, is putting its major research investment into vaccine research. Bunde expects vaccines to be "around for a long time."

'Guided Empiricism': Lederle Laboratories (Pearl River, N.Y.), which claims the largest virus research center in the world, has some compounds in the preliminary stage of development. Squibb's vice-president for research and development, Roland Dahl, expects the solution of the virus chemotherapy problem will come via "guided empiricism"—i.e., cut and try trials of compounds that are chemically related to known virus-killers.

Merck feels that chances of a major strike against viruses are improving all the time. Merck researchers—like a lot of others—would settle for a good antiviral, broad-spectrum or not.

Drug firms on the whole do not think that a successful antiviral would be very remunerative. One firm feels it would be a "good prestige item," feels the price would probably be prohibitive for animal or plant applications. An effective remedy for the common cold, of course, would probably command a large market.

Meanwhile, the pace of research quickens. An intensive virus classification and identification program was recently launched at the National Institutes of Health (Bethesda, Md.); and a virus "synthesis" was reported not long ago by the University of California's (Berkeley) Wendell Stanley.

Researchers are sure that the chemotherapeutic principles so successfully applied to bacterial diseases will eventually be equally effective against viruses.

DON'T LET PER-CHLOR
TAKE YOU
TO THE CLEANERS

The dry cleaning business uses large amounts of Perchloroethylene, and by using solvent recovery systems can save most of it for re-use over and over again. Otherwise, the Per-chlor would be lost to the atmosphere. If you evaporate solvents, let this example lead you to the savings possibilities of automatic solvent recovery.
The Barnebey-Cheney Company engineers, designs, fabricates and erects complete systems for handling most types of industrial solvents. Get the full story—write for the free bulletin: "Solvent Recovery Actually Takes Dollars out of the Air."

BARNEBEY-CHENEY
Company
CASSADY AT EIGHTH COLUMBUS 19, OHIO
In Canada: BARNEBEY-CHENEY LTD., St. Johns, Quebec

SPECIALISTS IN TECHNICAL SOAPS
POTASSIUM PALMITATE
Carload Quantities Available
• ORGANIC AMINE SOAPS
• AMMONIUM SOAPS
• POTASSIUM SOAPS
• SODIUM SOAPS
Inquiries Invited on All Quantities
BEACON
Chemical Industries, Inc.
35 RICHDALE AVE.,
CAMBRIDGE 40, MASS.

Signposts for the Search

A number of chemicals have already shown antiviral activity in tests with tissue cultures, embryonated eggs, and laboratory animals. Even though none of these compounds are practical for treating virus diseases, they serve as signposts toward the goal of virus chemotherapy. True viruses, incidentally, are sometimes defined as those microorganisms that, in their smallest infective form, are less than 0.4 microns in longest diameter.

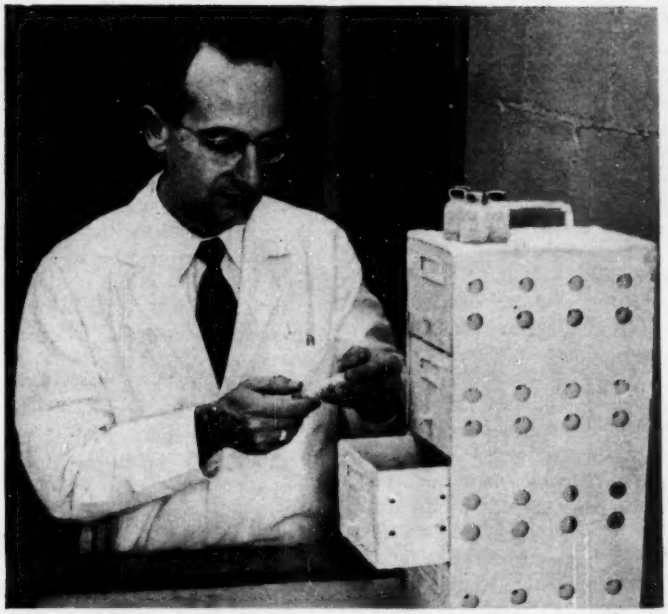
Shown below are some experimentally successful antiviral chemicals. Others include: vitamin analogs such as aminopterin (4-amino folic acid), A-methopterin, desoxypyridoxine, oxythiamine, and homobiotin; certain amino acids (e.g., arginine, lysine, etc.); variously substituted thiosemicarbazones; barbiturates; and antibiotics like Ehrlichin and Netropsin (derived from streptomyces).

Considering the thousands of compounds that have been screened for antiviral activity, this meager sprinkling of survivors serves mostly to underscore the nut-tough task researchers face. Hampered by lack of uniform screening methods (investigators use widely differing host systems, viruses, virus strains, etc.) and an only recently maturing knowledge of virus and cellular chemistry, the virus-drug seekers may have more than a generation of work ahead of them.

This, many investigators in the field readily admit. But they also point out that a major breakthrough in the fundamental chemical and biological virus studies could change the entire outlook in a trice. Such strokes of serendipity cannot be counted on—but, as experience in other drug research has proved time and again—neither can they be wholly discounted.

These compounds inhibit viruses by impeding:

Energy Transformations	Protein Synthesis	Nucleic Acid Synthesis	
		(Purine Analogs)	(Pyrimidines)
sodium monofluoroacetate	ethionine	8-azaguanine	2,4-dichlorophenoxy thiouracil
sodium malonate	methionine sulfoxime	2,6-diaminopurine	2-thiouracil
dinitrophenol	methoxinine	benzimidazole	2-thiocytosine
cyanide, azide,	methallylglycine		2-thiothymine
iodoacetic acid, etc.	norleucine		5-bromouracil
	canavanine		5-nitrouracil
	β-2-thienylalanine		5-hydroxyuracil
	fluorophenylalanine		5-*p*-nitrobenzamidouracil
	6-methyltryptophane		2,4-dithiothymine
	various α-amino sulfonic acids		2,4-diamino-5,6-dimethylpyrimidine
	N-dichloroacetyl-α-(*p*-nitrophenyl) glycine		

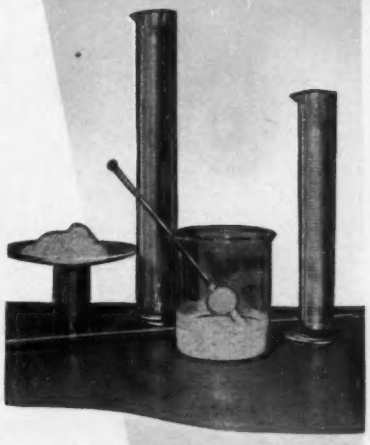


IN VITRO AND IN VIVO: Potential antiviral chemical agents are screened against test-tube cultures, embryonated eggs. Shown: Southern Research Institute's Frank Schabel (above) Upjohn's Wesley Cauldwell (foreground) and James Bennett.

DECREASE THE VISCOSITY OF A SYSTEM WHILE MAINTAINING THE SAME SOLIDS CONTENT WITH

MARASPERSE

LOW COST, MORE EFFECTIVE DISPERSANTS



The addition of only .05% to 3.0% of Marasperse disperses insoluble particles in water suspension and prevents agglomeration.

Viscous pasty masses become thin free-flowing fluids . . . Settling of suspended solids is prevented or greatly retarded . . . Slurries are kept fluid even with greatly increased concentration of solids.

Marasperse dispersants are non-hygroscopic, free-flowing powders — effective in both hard and soft waters.

Send coupon below for additional information on Marasperse products.

MARATHON *Corporation*
CHEMICAL SALES DEPARTMENT
ROTHSCHILD WISCONSIN

MARATHON CORP., ROTHSCHILD, WIS.
Send information on Marasperse Dispersants, File No. W-170, to:

NAME_____

COMPANY_____

ADDRESS_____

Highest quality, glacial or standard strength Acetic Acid, 56-80-84 per cent solutions • Denaturing grade Methanol, good color and odor

Acetic Acid

CROSSETT CHEMICAL COMPANY
Division of The Crossett Company

Methanol

Available in tank cars or drums. Details, samples, and prices sent upon request.

Crossett, Arkansas
P.O. Box 271
FOrest 4-2142

Specify KNOX Tower Packings

also
Spiral Rings
Raschig Rings
Berl Saddles

Cross-Partition Ring

GAIN TIME AND PROFITS ON KNOX TOWER PACKINGS

- UNIFORM QUALITY
- HIGH VOLTAGE PORCELAIN BODY
- ZERO POROSITY
- HIGH CHEMICAL PURITY
- IRON FREE
- HIGH MECHANICAL STRENGTH

Your Inquiry Will Receive Prompt Attention

KNOX PORCELAIN CORP.
KNOXVILLE 1, TENNESSEE

RESEARCH

Coal Mines Face Acid Test

It's not definite yet, but part of the U.S. Public Health Service's new allotment for water pollution research (CW, Aug. 11, p. 56) may go into a thorough field test of a process for inhibiting coal mine acid wastes. A top pollution problem, acid waste results from oxidation of iron pyrites, which line exposed walls, floors, etc., of coal mines.

An effective means of countering this acid formation could help in dealing with other industry corrosion problems, too.

The process—still largely a theory—that USPHS may test was proposed by Walter Patrick, physical chemist at Johns Hopkins University (Baltimore). It involves use of such chemicals as chromates, phosphates, etc., on mine surfaces to prevent corrosion of the pyrites. Just how the chemicals would be applied hasn't been divulged, but spraying and painting are two possibilities.

USPHS plans to turn over all process data now available to its sanitary engineering center at the University of Cincinnati. After reviewal, the group will decide whether to go ahead with full-scale field tests.

If field tests are held, and results look promising, USPHS will decide whether to seek a patent on the process for mine acid use (assuming it's patentable) or to make a public disclosure of process details so that industry can start its own experimental work.

Harried History: Patrick's discovery has had a turbulent career. It all began in 1952 when the Potomac River Basin Commission won a USPHS grant for basic research on mine acid wastes. The commission turned to Johns Hopkins' sanitary engineering experts, called in Patrick.

In 1953, Patrick theorized that a chemical inhibitor might prevent natural formation of acid in coal mines. With Floyd McCollum (a Johns Hopkins chemical engineering student who assisted in brief tests), he applied for a patent.

Opposition: But USPHS held firm against the patent application on the ground that any discovery made with support of USPHS funds be dedicated to public use. After two years, a settlement was reached. It was expected that a patent would be forthcoming.

A few months ago, however, the patent office upset these hopes by rejecting the Patrick-McCollum patent application for lack of sufficient scientific evidence.

Now, all three parties involved are taking steps to further test the theory. McCollum organized his own firm for that purpose. But it did not last long. He is turning over to the commission the laboratory and field-trial data he accumulated under Patrick's supervision and later as a Potomac River Basin Commission employee.

The commission, in turn, has relinquished all rights to the process, is forwarding this data to USPHS. Patrick, in line with an earlier agreement, has given USPHS all process rights dealing with mine acid waste prevention. This leaves USPHS free to make further tests on water-pollution control, perhaps seek a patent sometime in the future.

But Patrick — who broke a long silence in describing some of the process's details at last October's meeting of the Federation of Sewage and Industrial Waste Officials—reportedly retains free control of the process for all other potential commercial uses. He's continuing research on other oxidation problems.

APPARATUS

• A complete pore-structure analysis of any porous material can reportedly be made in 10 minutes with American Instrument Co.'s (Silver Spring, Md.) new Aminco-Winslow Porosimeter. The instrument measures pore sizes from 0.1 mm. down to 0.06 microns, pore volumes as small as 0.0005 ml. at each pore diameter. Potential use: in checking the performance and quality of filters, sintered metals, insulators.

• Labline, Inc. (Chicago) is out with a new instrument that rapidly measures the rate of corrosion in all types of metals exposed to corrosive liquids or gases. Called the Labline-Pure Corrosion Tester, it reportedly can—in the space of a few hours—predict the amount of corrosion that may take place in 5 or 10 years of field use.

• For accurate, high-speed weigh-

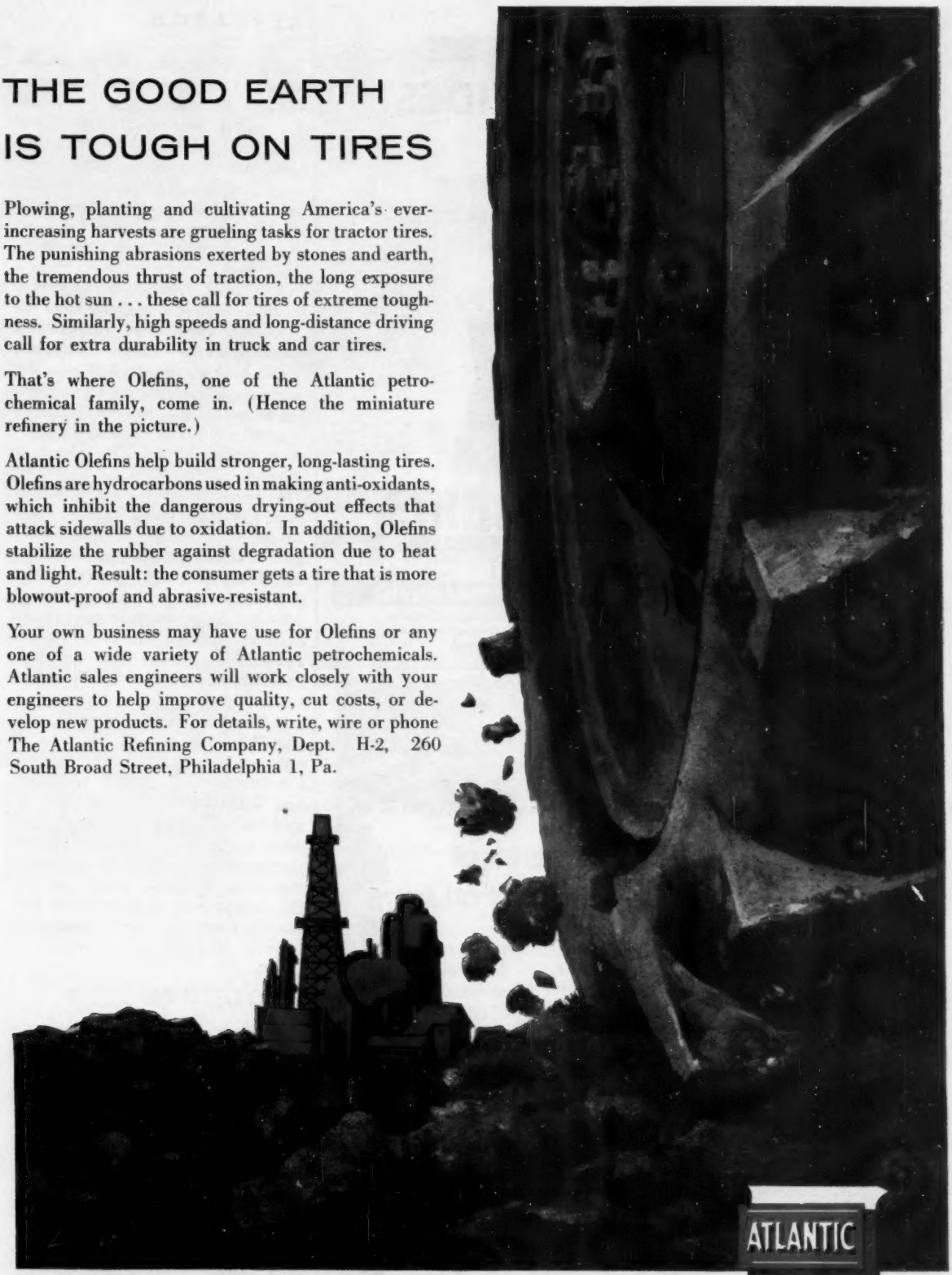
THE GOOD EARTH IS TOUGH ON TIRES

Plowing, planting and cultivating America's ever-increasing harvests are grueling tasks for tractor tires. The punishing abrasions exerted by stones and earth, the tremendous thrust of traction, the long exposure to the hot sun . . . these call for tires of extreme toughness. Similarly, high speeds and long-distance driving call for extra durability in truck and car tires.

That's where Olefins, one of the Atlantic petrochemical family, come in. (Hence the miniature refinery in the picture.)

Atlantic Olefins help build stronger, long-lasting tires. Olefins are hydrocarbons used in making anti-oxidants, which inhibit the dangerous drying-out effects that attack sidewalls due to oxidation. In addition, Olefins stabilize the rubber against degradation due to heat and light. Result: the consumer gets a tire that is more blowout-proof and abrasive-resistant.

Your own business may have use for Olefins or any one of a wide variety of Atlantic petrochemicals. Atlantic sales engineers will work closely with your engineers to help improve quality, cut costs, or develop new products. For details, write, wire or phone The Atlantic Refining Company, Dept. H-2, 260 South Broad Street, Philadelphia 1, Pa.



Philadelphia, Providence, Charlotte, Chicago • *In the West:* L. H. Butcher Co.
In Canada: Naugatuck Chemicals Division of Dominion Rubber Co., Ltd. • *In Europe:* Atlantic Chemicals SAB, Antwerp, Belgium • *In South America:* Atlantic Refining Company of Brazil, Rio de Janeiro

ORGANIC PEROXIDES

BENZOYL PEROXIDES

LAUROYL PEROXIDE

METHYL ETHYL KETONE PEROXIDE

- **Stocked at Convenient points to serve the expanding plastic industry**
- **Sole selling agent for basic producer**

MK

McKESSON & ROBBINS

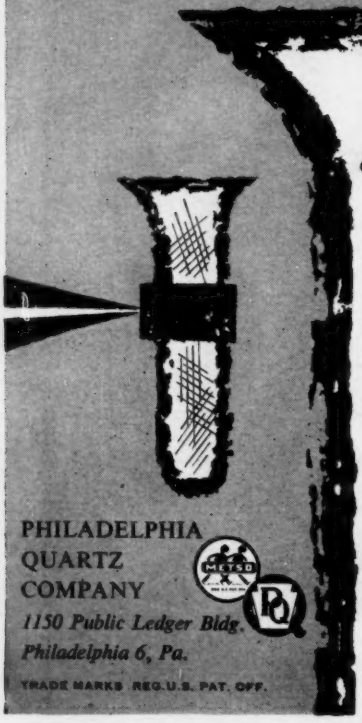
INCORPORATED

CHEMICAL DEPARTMENT

Nationwide distributors of heavy and fine chemicals

Atlanta • Boston • Buffalo • Burlington • Cedar Rapids • Chicago • Cleveland • Dallas
Davenport • Decatur • Des Moines • Detroit • Houston • Los Angeles • Milwaukee • Mobile
New York • Omaha • Peoria • Philadelphia • Phoenix • Pittsburgh • Quincy • St. Louis
St. Paul • San Antonio • San Diego • Sioux City • Wichita

for all your cleaners a true anhydrous metasilicate



metso anhydrous

Here's an anhydrous sodium metasilicate with the true metasilicate ratio. Metso Anhydrous' percentage of soluble silica (SiO_2) is in correct ratio to the alkali (Na_2O). You'll find Metso Anhydrous' higher SiO_2 content, (low CO_2 impurity) is a bigger value.

Use Metso Anhydrous for reliable performance in compounds for metal cleaning, soaker tank, spray washing, steam gun cleaning, machine dishwashing, dairies, packing houses, paper deinking, laundries, textiles, soap builders.

PHILADELPHIA QUARTZ COMPANY
1150 Public Ledger Bldg.
Philadelphia 6, Pa.

TRADE MARKS REG.U.S. PAT. OFF.

metso detergents
PQ soluble silicates

RESEARCH

ing, a new laboratory scale that's designed to cut normal precision weighing time by at least 50% is available for import from Holland. Equipped with liquid damping (to bring the scale into rapid balance), the instrument provides direct readings to 100 grams in divisions of 1 gram each. Further information may be had from the Netherlands Trade Commission (New York).

• A new high-vacuum brush-type fractionating still is available from the Rochester Division of Consolidated Electrodynamics Corp. Designated Type 4010-01 Brush Still, it's for separating heat-sensitive materials having molecular weights up to 900. The apparatus is said to be useful at pressures ranging down to 1 micron of mercury.

• Baird Associates-Atomic Instrument Co. (Cambridge, Mass.) offers an improved high-speed light-pulsing and modulation apparatus. It's designed to yield light pulses in the microsecond range, and modulated light beams at variable frequencies from dc. through the video region. Applications are in such areas as sound-on-film, photometry, biological studies.

• The National Bureau of Standards (Washington, D. C.) has designed an apparatus that directly measures the dynamic bulk modulus of solids and liquids. Designed primarily for studying the compressibility of polymeric materials as a function of time or frequency of applied pressure, the instrument reportedly makes possible the study of such properties (with reasonable precision) over a frequency range of 50-5,000 cps.

PRODUCTS

• A new alkanolamine with six reactive centers—monohydroxyethyltrihydroxypropylethylenediamine — is now offered (in essentially anhydrous technical grade) by Visco Products, Inc. (Houston, Tex.).

• New chemicals available from Distillation Products Industries (Rochester, N.Y.) include N,N-*bis* (2-hydroxyethyl) glycine; *p-tert*-butyltoluene; isobutyric anhydride; β-diethylaminopivalaldehyde; 2-dimethylaminoethyl acetate; 2,6-dimethylpiperidine; 2,4-dimethylthiazole; 3-hydroxy-1,3-diphenyltriazene; 2-methylindole; 2-methyl-1-nitronaphthalene.

"What genius invested our deposits in 6 tons of rust?"

Firestone EXON CHEMICAL SALES DIVISION

The one expense the controller can't control is unchecked corrosion!

Firestone EXON CHEMICAL SALES DIVISION

Corrosion's just a lot of rot to an aggravated stockholder!

Firestone EXON CHEMICAL SALES DIVISION

Alerted by Firestone, management is joining your battle against corrosion

The menace of corrosion and its tragic waste have now been thrust into the consciousness of executives on every level of management.

The sound counselling, pressed upon management by technical men for years, has been featured in a challenging series of advertisements over the Firestone Exon signature. It has alerted top-management to the effect of corrosion on every job and function of industry.

This campaign has made the case and eased the way for technical men. Technologists who have long known the power of PVC to stop corrosion cold are now getting the green light.

It's entirely fitting that Firestone Exon resins should lead in publicizing the technologist's war on corrosion. Firestone Exon has been campaigning against corrosion for many years.

This expanding line has proved itself in such diverse applications as self-supporting structures, dip and spray coatings, tank liners, pipes and fittings, valves and paints.

Whatever corrosives you use, whatever equipment you must protect, drop a note to Firestone today.

Firestone

EXON®

Who tripped up the Chairman of the Board with a corroded beam?

Firestone EXON CHEMICAL SALES DIVISION

Who chained the Executive Vice President to his desk with a lot of corrodible metal?

Firestone EXON CHEMICAL SALES DIVISION

Who keeps boxing in the Traffic Manager with corroded grates?

Firestone EXON CHEMICAL SALES DIVISION

What's that corroded flue doing in the Treasurer's office?

Firestone EXON CHEMICAL SALES DIVISION

"That'll be $10 for the order and 25¢ for the corrosion!"

Firestone EXON CHEMICAL SALES DIVISION

CHEMICAL SALES DIVISION • Firestone Plastics Co., Dept. 64 K, Pottstown, Pa. • A Division of the Firestone Tire and Rubber Co.

from sulfur or sludge...

For over thirty-six years, Consolidated Chemical has been a leader in sulfuric acid manufacture. The consequent wealth of accumulated know-how has led, in recent years, to the development of a unique regeneration process for refinery sludge and other sludge . . . a process that does away with the costly and perilous disposal methods of the past.

New, white, 99% acid can now be made from sulfuric acid sludge containing a low concentration of free acid.

Consolidated Chemical, now a Division of Stauffer Chemical Company, offers this regeneration service on a contract basis to oil refineries and other industries, in a wide geographical area.

Stauffer CHEMICALS SINCE 1885 CCI

CONSOLIDATED CHEMICAL INDUSTRIES

DIVISION OF STAUFFER CHEMICAL COMPANY

640 Esperson Building, Houston 2, Texas • 380 Madison Avenue, New York 17, N. Y.

Market
Newsletter

CHEMICAL WEEK
August 18, 1956

The wave of price changes noted over the past several weeks appears to have subsided. But significant ones are still popping up. Take thiourea, for example. Last week, one major producer, American Cyanamid, posted an across-the-board 3¢/lb. reduction; it's the third cut in three years for the intermediate, and chances are other makers will (if they haven't already done so by now) follow Cyanamid's lead.

New prices bring truck-load quantities (20,000 lbs. minimum) to 33¢/lb., smaller amounts to 35¢. And the reason for the latest reductions? Says Cyanamid: reduced manufacturing costs brought about by operating economies.

One price prediction fulfilled, one nearly so. That's the latest score in the metals market. Aluminum prices, as indicated here last week (*CW Market Newsletter, Aug. 11*), are up; the spread between copper producers' and custom smelters' quotes has almost, but not quite, disappeared.

Aluminum ingot prices moved up 1.2¢/lb. late last week, in the wake of producers' signing new three-year labor contracts (*see pp. 32, 44*). The hike was slightly under the 1.5¢/lb. the trade expected, as was the average 4% increase tacked onto alloy grades of the metal and on aluminum mill products (sheet, strip, plate, foil, etc.). Speculation had it that tags on the latter items would be increased about 6%.

On copper, custom smelters' prices moved to within a shade of primary producers' 40¢/lb. tag during the past week, with establishment of a new 39¾¢/lb. level. Activity in the copper market hasn't been brisk of late, but trade observers report that the world market appears a little firmer this week—and that may be adding strength to domestic prices.

•

The steel strike, of course, had varying effects on a number of chemicals. One of the hardest hit was sulfuric acid. Marketers, totaling up business lost, concede that large-volume sales of sulfuric slipped away because of the shutdown.

Buying interest, however, is expected to pick up considerably, and there are already signs of a definite brightening in acid ordering. Demand for chemical manufacturing uses is good, and sulfuric headed for agricultural outlets, though now moving relatively slow, is also expected to show some improvement soon.

•

On the other hand, outlook for toluol—both coke-oven and petroleum material—appears as dim as it did before the steel dispute. Sellers of petroleum-derived toluene had hoped that the coal-tar industry shutdown would have consumers dipping deeply into petrotoluene stocks, but they didn't to any great extent. Now, with steel getting ready to resume record-breaking operations, more coke-oven toluol will pour into bulging stockpiles.

And adding further dullness to toluol's future: little indication that now-inactive government buying for military purposes—not too long ago an important market-firming influence—will be resumed; loss of European cus-

tomers, who have for months (*CW Market Newsletter, Oct. 8, '55*) been plied with bargain-priced foreign toluol.

•

Benzene hexachloride customers won't be shortchanged on commitments made by Olin Mathieson despite last week's explosions (*CW Business Newsletter, Aug. 11*) at its Niagara Falls, N. Y., installations. The company reports that it has sufficient inventory at other points in the country to meet requirements, and that other producers have offered to help out if necessary.

Although BHC demand is generally somewhat slower now than it was during the spring peak period, supply, in some areas of the country, especially of low gamma material, is said to be fairly tight. Export calls, too, are reportedly heavy.

•

Prices of magnesium and magnesium products are higher this week. Announcement of the increases, by Dow, follows closely the settlement (*see p. 18*) of a four-week-old strike at Dow's Freeport, Tex., extraction plant, and at the government-owned Dow-operated magnesium installation at nearby Velasco.

The advances, effective immediately, come to 1½¢/lb. on primary pig and ingot—lifting the former to 35¼¢/lb. and the ingot to 36¢—and boost most wrought magnesium items about 5%. Ingot and pig tags are f.o.b. Velasco.

This is the second time in four months that magnesium consumers have been handed a price hike (*CW Market Newsletter, April 28*).

•

Slackened demand for English polyethylene, plus the soon-due tremendous increase in capacity (*CW, July 14, p. 85*), may be behind Imperial Chemical Industries' (currently the sole British producer) just-posted 4¢/lb. cut on its Alkathene.

ICI, which last year turned out 60-70 million lbs. of polyethylene, will complete, early next year, a new plant that will boost its capacity to nearly 114 million lbs./year. Union Carbide is now building a 23-million-lbs./year plant, and Monsanto has indicated that it, too, will build a polyethylene installation (near Southampton).

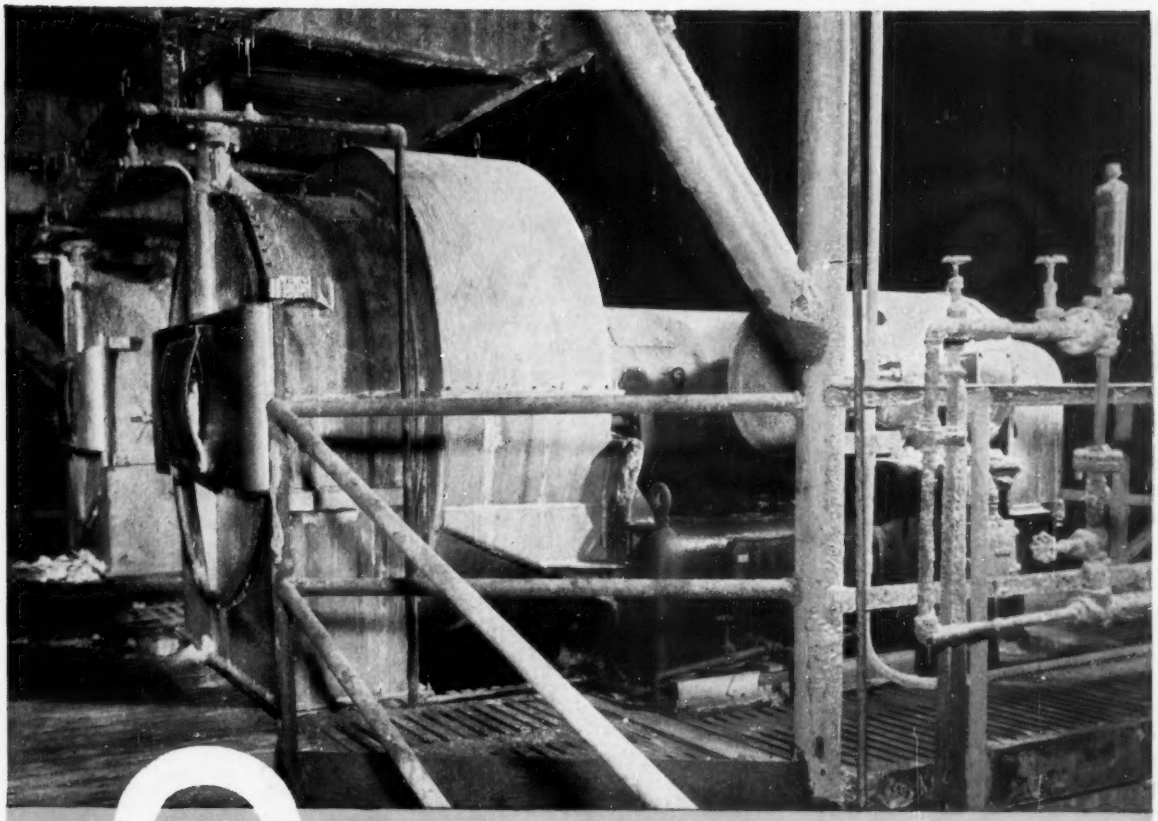
•

How much edible oils and fats will be available for export during the upcoming crop year? Some 15% less than the estimated 2.7 billion lbs. available in the current season, according to the American Soybean Assn.

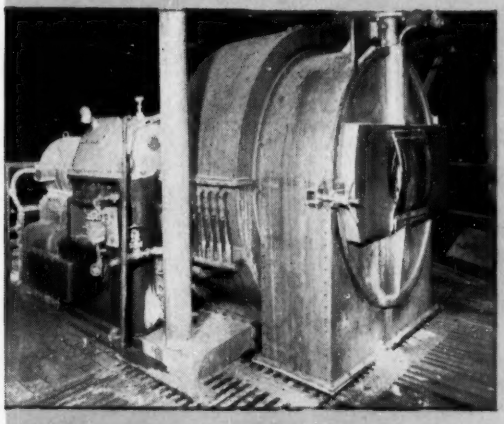
SELECTED CHEMICAL MARKET PRICE CHANGES— Week Ending August 13, 1956

UP

	Change	New Price
Crude coconut oil, tanks, N.Y., lb.	$0.00375	$0.1225
Crude bees wax, African, bgs., lb.	0.02	0.67
Silver, bullion, ingots, cs., Troy, per oz.	0.00625	0.9075



Eight years of trouble-free centrifugation of ammonium sulphate with BAKER PERKINS continuous type centrifugals



Installed at a plant of Phillips Petroleum Company's subsidiary, Phillips Chemical Co. in Pasadena, Texas, where they are separating ammonium sulphate slurries for fertilizer, each of these two Baker Perkins Continuous Centrifugals is producing 24-30 tons per hour of solids. One of the B-P "ter Meer" units went into service in August, 1948, eight years ago, and the other a few months later, yet during all that period of steady use only routine maintenance was necessary. They are both B-P Type S Size 48 Continuous Centrifugals, designed for centrifuging relatively free-draining crystalline, granular, and fibrous materials.

The Type S is particularly suited to handling friable material because it contains no scrapers, baffles, rakes, or plows to cause crystal disintegration. Constant speed drum rotation requires very low power input. All Baker Perkins "ter Meer" Centrifugals are truly continuous, needing no timing or cycle controllers for feeding or other action. If you would like more information on our Type S, Type HS (for filterable fine slurries) or Type HF (for non-filterable slurries or liquid-liquid mixtures), write for our illustrated catalog.

BAKER PERKINS INC.
CHEMICAL MACHINERY DIVISION
SAGINAW, MICHIGAN

339

Diversity Pays Off In Wider Western Sales

If you're a Westerner and you make paper, fertilize hops, inoculate monkeys, or wash thousands of men's shirts, chances are you deal with Van Waters & Rogers. This sprawling concern, with offices in 13 cities from Houston, Tex., to Vancouver, B.C., has made a success of marketing such disparate items as twine and cordage, upholstery supplies, scientific instruments and industrial chemicals. The company, including all its subsidiaries, is now probably the largest chemical distributor west of the Rockies, last spring made its first public stock sale.

Last year, it grossed $56,760,000, of which some $35 million comprised sales of industrial and agricultural chemicals, veterinary medicines, and concentrated feed supplements. And this year, say founders* George Van Waters, president, and Nat Rogers, executive vice-president, business looks even better. In the first six months, gross hit $31 million.

Major growth of VW&R dates from 1950, when it purchased all the outstanding stock of San Francisco's Braun-Knecht-Heimann Co., which then owned 50% of Scientific Supplies' outstanding stock. In '53, VW&R obtained all B-K-H stock, changed Scientific Supplies into an operating division

Spencer Service is Wonderful

"Comrade . . . can discover no way to claim we invented Tanky!"

NEED AMMONIA?

For immediate, fast delivery of synthetic methanol contact your nearest Spencer Chemical Company office. You'll learn for yourself why so many people say our "Tanky" delivery service is wonderful.

SPENCER®

America's Growing Name In Chemicals

SPENCER PRODUCTS: "Poly-Eth" Polyethylene • Ammonia (Commercial and Refrigeration Grade) • Aqua Ammonia • 83% Ammonium Nitrate Solution • Synthetic Methanol • Formaldehyde • Hexamine • "Mr. N" Ammonium Nitrate Fertilizer • SPENSOL (Spencer Nitrogen Solutions) • FREZALL (Spencer Dry Ice) • Cylinder Ammonia

SPENCER CHEMICAL COMPANY

GENERAL OFFICES: Dwight Bldg., Kansas City 5, Mo. DISTRICT SALES OFFICES: 500 Fifth Avenue, New York City; First National Bank Bldg., Chicago, Ill.; Candler Bldg., Atlanta, Ga.; Union Planters National Bank Bldg., Memphis, Tenn.

SPERRY

For over 60 years SPERRY has originated or been closely identified with every major filtration development. That's why you can specify SPERRY with confidence —whether it's a standard or custom-engineered Filter Press of superior filtration and construction . . . one of Sperry's quality filter bases . . . a powerful Sperry Closing Device . . . or any Sperry labor-saving equipment—designed to solve your filtration problems —best!

FILTER PRESSES

FREE! Write for complete Sperry Catalog.

D. R. SPERRY & CO.
Batavia, Ill.

Sales Representatives:
George S. Tarbox, 808 Nepperhan Avenue, Yonkers, New York
B. M. Pilhashy, 833 Merchants Exchange Building, San Francisco 4, Calif.
Aldredge & McCabe, 847 E. 17th Ave., Denver 18, Colo.
Texas Chemical Engr. Co., 4101 San Jacinto, Houston 4, Texas

Barium Carbonate
Barium Hydrate
Barium Sulphate
X-ray

BERKSHIRE CHEMICALS

BERKSHIRE

ISCO

Epsom Salts
Talc
Silica
Magnesium Silico Fluoride

BERKSHIRE CHEMICALS, INC.
420 LEXINGTON AVENUE • NEW YORK 17
55 New Montgomery St. • San Francisco 5, Calif.
Innis Speiden Company Division
New York • Philadelphia • Boston • Cleveland • Chicago

of the parent company. Through exchange of capital stock, VW&R also obtained control of Braun Corp. Both B-K-H and Braun have since been operated semiautonomously.

In '53, again by exchange of capital stock, VW&R acquired The Greeno Co., a Los Angeles distributor of upholstery supplies. VW&R also has two wholly owned British Columbia subsidiaries—Van Waters & Rogers (B.C.) Ltd., and Scientific Supplies Co., Ltd. There's another wholly owned subsidiary, Van Waters & Rogers of California, Inc. (incorporated in Washington), engaged in sale and distribution of agricultural and upholstery supplies in northern California, Utah and related areas.

And during the past five years, VW&R has undergone a $2-million facilities expansion program, including: an office in Vancouver; an office and warehouse in Salt Lake City; a warehouse and office for Scientific Supplies in Seattle; a building for Van Waters & Rogers in San Francisco; a building for Braun Corp. in Los Angeles and Phoenix. At the same time, it has modernized and expanded its Spokane office and warehouse as well as purchased Dow Chemical's liquid chlorine packaging operation in Los Angeles.

Laurens H. Reyburn, B-K-H president, who sits on VW&R's executive committee with George Van Waters and Nat Rogers, coordinates chemical activities for the parent company, B-K-H and Braun.

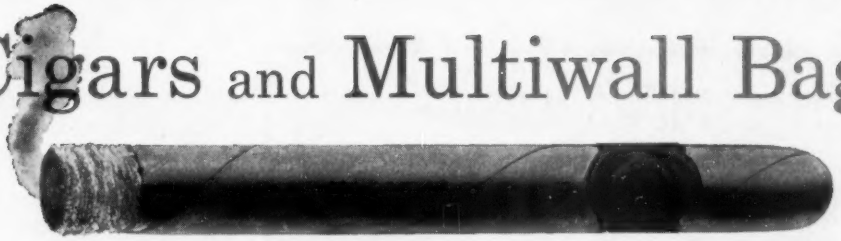
The Industrial Chemical Division started as an offshoot of the laundry and dry-cleaning supply division in 1929, is now the company's largest division, employs about half of VW&R's total force of 880. The division's price list covers virtually everything, from acetone to zinc, from acetic acid to xylene. And its list of principals numbers 47 in all.

Sales Operations: Because of longer distances between manufacturer and customer, VW&R feels that Western chemical buyers need the services of a distributor more than do their Eastern or Midwestern counterparts. Even if the manufacturer happens to be close at hand, VW&R believes it can do the better selling job. Reason: while its salesmen may not know the product quite as well as a manufacturer's representative, they learn quickly, know the prospect a lot better. And although VW&R has fixed departments, each with its own salesmen, no client is called upon by more than one of its salesmen. A laundry, for example, will give its orders for industrial chemicals to a salesman from the laundry and dry-cleaning department. Thus a VW&R salesman gets to know his customer and his customer's needs more intimately than could the salesman of a chemical company.

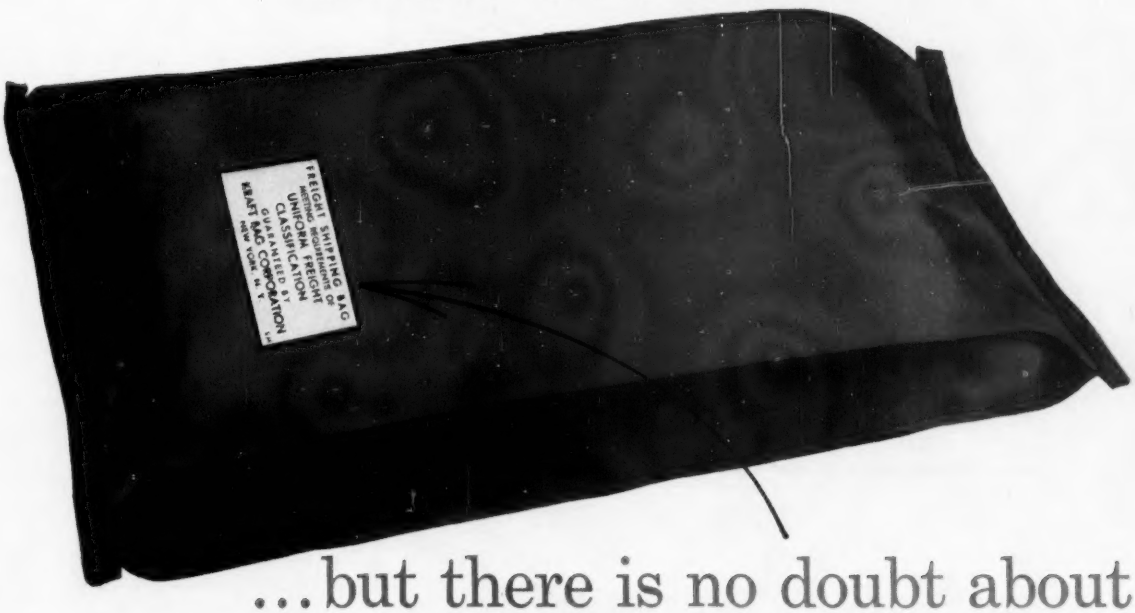
Says Assistant Treasurer Stewart Rogers: "We are contract repackagers, brokers, principals' agents, distributors. But more important, we are experts on the West and on Westerners. We're

VAN WATERS & ROGERS: Partners in polyglot chemical activities.

Cigars and Multiwall Bags



Kraft Bag Corporation, as a manufacturer of multiwall bags, is in the same position as the cigar manufacturer who complained that everything to be said about his 25c cigars had already been said about 5-centers!



...but there is no doubt about the quality of the multiwall bags that bear the Kraft Bag Corporation stamp!

Gilman PAPER CO.
* St. Marys Kraft Corp.
* Gaylord Container Div.
* The Coldwell Corp.
* Kraft Bag Corp.

Our completely integrated plants and modern facilities producing every type of heavy-duty valve or open mouth bag, are second to none!

As an exponent of true specialization, there isn't a single known or desirable time-and-labor-saving development that we haven't already either considered, initiated, adopted or built into multiwall bags we are called upon to make for America's industries, while continuing our search for still better ways to package our customers' products.

If your product can be packaged in a multiwall bag—you can depend on us to make the bag to fit your product.

Investigate ***The KRAFTPACKER®*** *Open Mouth Bag Filling Machine for free-flowing material ... highest accuracy and production... reduces packaging costs at an unbelievable rate.*

KRAFT BAG CORPORATION

Gilman Paper Company Subsidiary
630 Fifth Avenue, New York 20, N. Y.
Daily News Bldg., Chicago 6, Ill.
Plants at St. Marys, Georgia and Gilman, Vermont

POTASSIUM CHLORIDE
for the
CHEMICAL and FERTILIZER INDUSTRIES

CHEMICAL GRADE MURIATE OF POTASH
62.73% K_2O (99.3% K CL) MINIMUM

HIGRADE MURIATE OF POTASH
62/63% K_2O

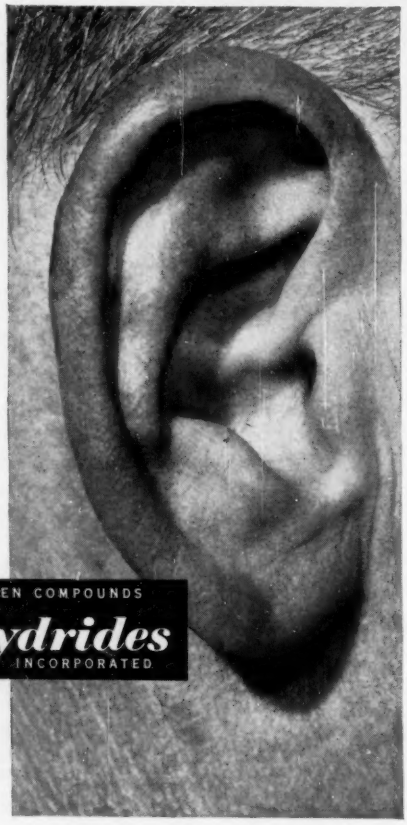
GRANULAR MURIATE OF POTASH
60% K_2O MINIMUM

SUNSHINE STATE POTASH
A PRODUCT OF NEW MEXICO U.S.A.
Reg. U. S. Pat. Off.

UNITED STATES
POTASH COMPANY
Incorporated
30 ROCKEFELLER PLAZA,
NEW YORK 20, N. Y.

We will gladly
TELL YOU WHY
MH Chemical Hydrides
provide profitable
process advantages for
fast, high-yield reductions,
condensations, and other
production steps.

Calcium Hydride
Sodium Hydride Oil Dispersion
Sodium Borohydride
Lithium Aluminum Hydride
Potassium Borohydride



MH
PIONEERS IN HYDROGEN COMPOUNDS
Metal Hydrides
INCORPORATED

CONGRESS STREET
BEVERLY, MASSACHUSETTS

familiar with local raw material preferences—and the reasons behind them; company reputations in the West; the Western freight problem—which most Easterners have a hard time grasping; the amount of market saturation for any product out here; and product substitutes that move in the West."

Success Factors: Also contributing to VW&R's sales success:

- The firm operates both local and long-distance truck fleets.
- Sales of scientific instruments often lead to new chemical accounts.

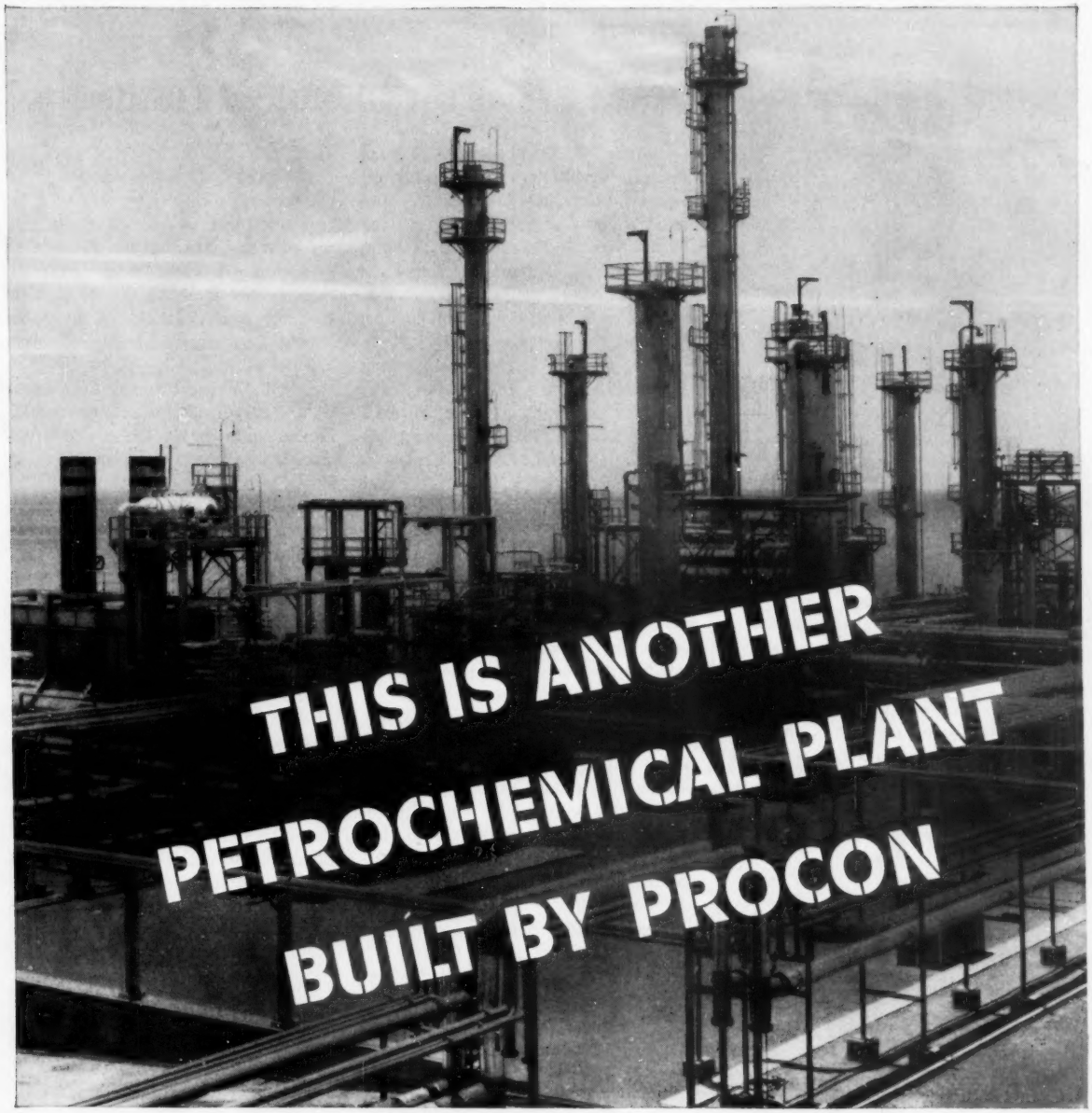
Though the company tries to avoid handling competing lines, because of the complex character of the chemical industry, it isn't always possible. For example, it competes with Becco in the Pacific Northwest (selling Du Pont products), sells Becco's products in Dallas.

Big Role for Research: Unlike most distributors, VW&R engages actively in new product development and comprehensive market research. Sometimes as many as 26 men work in those areas, and there are currently eight full-time men in the company's new product development department. At the moment, VW&R is pushing zein made by Corn Product—as a chemical in its own right, not as a corn protein. And it's working with Boeing and General Electric on Commercial Solvents' nitroparaffins.

Several years ago, the company helped Lebcol, a Seattle fish liver vitamin A producer, find business for a new line of fatty acid methyl esters. Other products that VW&R has helped introduce: defoamers for the pulp and paper industry, viscosity reducers, pigment wetters and greaseproof paper coatings. Additionally, the firm helped Crown Zellerbach get its silvichemical (Orzan) sales program rolling. Product development has played a major role in expanding VW&R's product line and sales.

Future growth of the firm must overcome several obstacles. Inventory control and communications between sprawling segments of the company are currently top problems. To cure these ills—and pave the way for further growth—VW&R is planning to merge its various companies, install standardized bookkeeping and accounting.

Confident of the future, VW&R will probably sell more of its stock next year, put the cash into expansion.



This fine plant overseas is just one example of Procon's continually growing accomplishments in petrochemical construction. Like all our projects, it was completed on schedule and up to every specification.

Procon's world-wide construction organization provides a complete service, including new plant construction, additional process facilities, expansion or modernization, to the petrochemical, chemical and oil refining industries. Our services are available to you, any time, anywhere.

PROCON *Incorporated*

1111 MT. PROSPECT ROAD, DES PLAINES, ILLINOIS, U.S.A.

PROCON (CANADA) LIMITED, TORONTO 18, ONTARIO, CANADA
PROCON (GREAT BRITAIN) LIMITED, LONDON, W. C. 2, ENGLAND
PROCON INTERNATIONAL S. A., SANTIAGO DE CUBA

WORLD-WIDE CONSTRUCTION FOR THE PETROLEUM, PETROCHEMICAL, AND CHEMICAL INDUSTRIES

Who makes the *Clearest Pyrethrum Extract?*

As the recognized pioneer in the development and processing of pyrethrum, MGK is the original and first producer of standardized pyrethrum extracts of brilliant clarity. In addition, we have developed excellent synergized pyrethrum concentrates, dusts and powders. If your insecticidal sprays, dusts or aerosols include the use of pyrethrum in any form, or the use of its companion product allethrin, write for the latest authoritative data. We also have available recent information concerning the most effective synergists, MGK 264 and piperonyl butoxide.

McLAUGHLIN GORMLEY KING Company

1713 S. E. FIFTH STREET / MINNEAPOLIS, MINNESOTA

it's all yours to read . . . clip . . . file

. . . when and where you want to . . . if you have your *own* subscription to CHEMICAL WEEK. Simply mail the attached coupon today to receive your personal copy for less than 6¢ a week.

Chemical Week
330 W. 42nd St., New York

Please enter my personal subscription to CHEMICAL WEEK for one year at $3* and bill me later.

Name_____
Position_____
Home Address_____
_____
Company_____

*Rate for U.S., U.S. Possessions, Canada only

Fight Brews on Chemical Hauls

Judging by the current rash of requests by Western truckers for extended Interstate Commerce Commission certification, chemical activity in the West is booming. In the past three months, at least five important hearings have been held by ICC examiners in Salt Lake City, Seattle, Portland and San Francisco.

Most significant: the meeting held July 23-25 in San Francisco. There, ICC Examiner Roy Linn listened patiently while Pacific Intermountain Express (Oakland, Calif.) paraded a dozen representatives of the chemical industry to testify that the West needs increased tank truck service—and that PIE is the one to provide it.

PIE is seeking authority to become the first motor carrier to operate tank trucks in all 11 Western states, as well as the first to provide broad service between the major chemical centers of California and Texas.

One of the largest commodity carriers in the country, but currently only a moderate factor in the Western chemical tank truck picture, the company now has ICC authority to operate in and out of California-Oregon-Washington, California-Oregon-Idaho, Idaho-Washington and Idaho-Montana.

Backing PIE's petition are American Mineral Spirits, Brea Chemicals, Celanese, Monsanto, Philadelphia Quartz, Phillips Chemical, Union Carbide, Arrow Gas, Edmonds Chemical, Kerley Chemical, Salt Lake Tungsten, and Sure Seal Corp. They claim that if interstate tank trucking were more widely available between California, Nevada, Arizona, New Mexico, Utah, Colorado and Texas, their customers would benefit through better service—and the companies would benefit through increased sales.

PIE's application overlaps those filed recently by other carriers. W. S. Hatch Co. (Salt Lake City) has applied for authority to haul from Utah, Colorado, Nevada and California to all 11 Western states. A ruling on this is now pending from the commission, as are rulings on three related hearings recently held in Seattle, Portland and San Francisco. Involved in these hearings were Inland Petroleum Co. (Seattle), Everts Commercial Transports, Inc. (Eugene, Ore.), and Pacific Truck Service, Inc. (San Jose, Calif.). All have applied for broader authority.

These three companies are setting up an interchange system for mutual operation of equipment, terminals, maintenance facilities, communication facilities and dispatching, and plan to use this system whether they get broader authority or not.

Inland, at present, has only intrastate authority in Washington, with limited authority in Idaho and Montana. It's seeking authority for Oregon, Idaho, Montana and California. Everts, with authority for Washington and Oregon and limited authority for California and Idaho, seeks broad authority for California, Idaho, British Columbia and Mexico. Pacific Truck, currently an intrastate California trucker, seeks authority to serve Utah as well.

Everts specializes in phenol, formaldehyde and plywood resins and adhesives (with some acid and fertilizer hauls). The company operates 16 specialized stainless steel rigs, is probably second only to St. Johns Motor Express (Portland) as a chemical hauler in the West. If it receives broader authority, and is successful in setting up the 3-way interchange, Everts expects to double its '56 volume of $750,000 within five years.

Inland, with 14 stainless steel rigs, operates big-volume runs in Washington between Seattle, Tacoma, Vancouver and the Tri-City area of Pasco, Richland and Kennewick, and trucks heavy chemicals into Trail, B. C.

Opposition: PIE, Consolidated, St. Johns and railroads are fighting any enlarging of Pacific Truck Service, Inland and Everts.

What's behind all the ruckus? Bill Cannon, director of traffic for PIE's tanker division, claims PIE isn't "aiming for business now held by the railroads—we're counting on entirely new business."

This view isn't shared by the railroads, however. Wallace Wilhite, San Francisco attorney representing many railroad interests (including the powerful Pacific Southwest Railroad Assn.) at the San Francisco hearings, said that truckers want new authority because they've lost much of their

PRODUCING SYNTHETIC ORGANICS?

Investigate TC TENNESSEE CORPORATION

Para content exceptionally high

Total Toluene Sulfonic Acid 96% or above

Superior physical form. Completely liquid above 80° F,

Anhydrous, too!

We Solicit Your Inquiries on — Para Toluene Sulfonic Acid, Anhydrous.

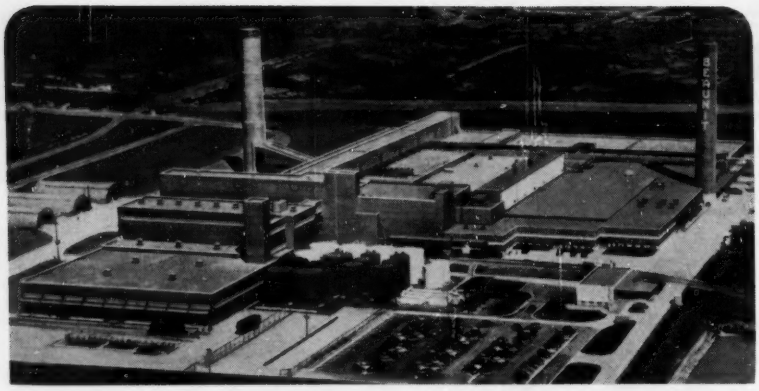
ORGANIC CHEMICALS DIVISION

TENNESSEE TC CORPORATION

617-29 Grant Building, Atlanta, Georgia

lucrative bulk petroleum business to the pipeline carriers.

The chemical hauling business in the West is at the same stage now that bulk petroleum hauling was 30 years ago. Then, bulk petroleum hauls were relatively long, averaging over 200 miles apiece. But they've been gradually shortened, and the average haul is now well under 100 miles (though volume is way up, of course). Shippers make their big profits on long hauls, where they enjoy a high use factor; and since Western chemical hauls generally range from 150 to 2,000 miles, there's



Beaunit Mills, Coosa Pines, Ala. This plant was built in two units. Unit #1 has a capacity of 10 million pounds per year of viscose textile yarn. Unit #2 has a capacity of 36 million pounds per year of viscose tire cord.

An experienced corps of consultants and designers to work with you for a low cost competitive plant or enlargement.

LOCKWOOD GREENE
ENGINEERS-ARCHITECTS

Boston 16, Mass. 316 Stuart Street
New York 17, N. Y. 41 East 42nd Street
Spartanburg, S. C. Montgomery Bldg.

OVER A CENTURY OF INDUSTRIAL PLANT DESIGN EXPERIENCE

Safer! Stronger! Cost-Cutting!

Aero RUBBER-CUSHIONED
STANDARD CORK-CUSHIONED
CARBOY BOXES
5 - 6½ - 13 Gal.

Longer-life, lower breakage, precision-made carboy boxes, built to I. C. C. specifications. Proof against rough handling and long-haul hazards. Cork or rubber-cushioned: The Strongest and Safest Made. Prompt service and deliveries.

BAUM & WILLSE DIVISION
UNITED BOX & LUMBER CO.
45 Wheeler Point Road · Newark N. J.
MArket 2-4500
★
Extra Bottles - All Sizes From 1 to a Carload
Serving entire chemical industry over 35 years

5, 6½ & 13-Gal. **PLASTIC BOTTLES**
Encased in "POLY-STANDARD" CARBOY BOXES. Approved ICC-1G. Durable. Light weight.

Inquiries cordially invited

Gentle Docking

SUPPLIERS of chemical muds to offshore oil well drillers have one unusual problem: rough mooring of the delivery vessel can physically wreck a customer. National Lead's solution of this problem is its new, specially constructed barge, the *George L. Ratcliffe*. It's fitted with a cruiser anchor and winch system

obviously plenty of competition among carriers for this business.

Besides this distance factor, there's another enticement for truckers in the Western chemical business—much of the business can't be touched by the railroads. Although rail carriers can often offer a plant door-to-door delivery on some chemicals, they generally can't promise a farmer door-to-door delivery on fertilizers—and fertilizers constitute a major portion of the chemical shipping business in the West. Similarly, most adhesive shipments go to plywood mills, which are not generally located on mainline

Moors the Sale

that can gently pull the barge alongside the drilling platform in crablike fashion. Auxiliary fore-and-aft propulsion units can also dock the vessel, hold it in place during unloading operations. Towed by tug to the site, the barge has a capacity of 1,500 tons, can deliver both bulk and bagged cargo.

PROOF

of versatility of EMPOL® 1022 Polymerized Fatty Acid

More than 80 Use-Patents Already Issued to U.S. Companies!

More and more companies are finding that Empol 1022 offers wide possibilities for exploitation in new products...exclusive products. More than 80 use-patents held by these companies are dramatic proof of the versatility and new-product potential of this unique raw-material.

This liquid, high molecular weight (C_{36}), dibasic acid still offers unlimited opportunities for the development of new, exciting end-products. Its dibasic structure, high molecular weight (C_{36}), excellent heat-stability, and high viscosity make it ideal for polyesters, esters, polyamides, soaps and other derivatives in such applications as adhesives, coatings, petroleum products, surfactants, resins and rubbers.

Why not investigate Empol 1022 and see how it can lead to profit-making end-products for you? Mail coupon below for literature or write for evaluation samples.

Emery

Fatty Acids & Derivatives
Plastolein Plasticizers
Twitchell Oils, Emulsifiers

Emery Industries, Inc., Carew Tower, Cincinnati 2, Ohio
New York • Philadelphia • Lowell, Mass. • Chicago
San Francisco • Cleveland
Warehouse stocks also in St. Louis, Buffalo, Baltimore and Los Angeles
Export: Carew Tower, Cincinnati 2, Ohio

Emery Industries, Inc., Dept. 1-8
Carew Tower, Cincinnati 2, Ohio

Please send complete information on Empol 1022 Polymerized Fatty Acid.

Name.....Title.....
Company.....
Address.....
City.....State.....

We'll Grind Chemicals More Quickly, Efficiently . . . and Save You Money!

• We have fluid energy mills, hammermills, blenders, sifters, liquid impregnators, packaging equipment. We can give you ultra-fine grinding, intimate blending, drying, removal of contaminants or separation by gravities, close control of particle size, increased surface and absorption.

Use our facilities for your
RESEARCH • PILOT PLANT STUDIES
MARKET EVALUATIONS
SALES DEPARTMENT
PROCESSING DEPARTMENT

Phone, wire or write today—our custom grinding and processing service can save you time —and MONEY!

Pittsburgh Plate Glass Co.
Corona Chemical Division
Moorestown, New Jersey

OLDBURY
1896 ®

PHOSPHORUS (Yellow or White)
PHOSPHORUS OXYCHLORIDE
PHOSPHORUS TRICHLORIDE
PHOSPHORUS PENTACHLORIDE
PHOSPHORUS PENTASULFIDE
PHOSPHORUS SESQUISULPHIDE
AMORPHOUS PHOSPHORUS
PHOSPHORIC ANHYDRIDE
PHOSPHORIC ACID
PHOSPHOROUS ACID
HYPOPHOSPHOROUS ACID
ALKYL ACID PHOSPHATES (Alkyl Phosphoric Acids)
SODIUM CHLORATE
POTASSIUM CHLORATE
POTASSIUM PERCHLORATE
HYPOPHOSPHITES
OXALIC ACID
ZINC PHOSPHIDE

OLDBURY
ELECTRO-CHEMICAL COMPANY
Executive Offices:
NIAGARA FALLS, NEW YORK
Sales Office:
19 RECTOR STREET, NEW YORK 6, N. Y.
Plants:
NIAGARA FALLS, N. Y. COLUMBUS, MISS.

railroads. For example, shipping adhesives from the Pacific Northwest to U.S. Plywood's plant in Eureka, Calif., by rail requires a haul to San Francisco and then a back haul of some 250 miles to Eureka.

Secondly, rail shipments often require rehandling. While this is not too important to most heavy industrial chemicals, it becomes significant in specialty chemicals. The railroads, which have often answered the rehandling argument with "piggyback" shipments, have not yet tried "piggyback" tank trucks, though few doubt that this will soon be forthcoming.

The current trucking picture won't be clarified for some months, but whatever the outcome, there are almost bound to be more shipping facilities available to chemical shippers. Celanese is already counting on shipping chemicals from its Bishop, Tex., plant into California and the Pacific Northwest; Carbide has plans to ship ethylene glycol from its new Los Angeles plant to the Intermountain area.

More Demurrage Soon?

If the railroads get their way, there will be a hike in freight car demurrage charges beginning Sept. 1. Tank cars, generally, won't be affected; boxcars, others, will feel the pinch.

Here's what the railroads are proposing: two free days, then $4/day for the following two days, $7 for each of the next two days, and $10 for each day thereafter. In addition, there will be charges for Saturdays, Sundays and holidays under both the straight and average plans after a car has been held for two days beyond free time. The debit period on any one car, which might be offset by credits under an average agreement, will be cut from four days to two.

Rates are now $3/day for the first four days after a two-day free time, and $6 for each succeeding day, with Saturdays, Sundays and holidays exempted from charges.

Need for increasing demurrage charges, say the railroads, is to speed turn-around time of cars and to bring in more revenue to help pay for new cars. The railroads told Interstate Commerce Commission that about 20% of all cars are being held overtime now—highest since 1950. And, while demurrage rates have not been

Using Salt Efficiently

by **INTERNATIONAL SALT COMPANY, INC.**—America's largest producer of salt

Unloading Bulk Salt From Boxcars—at Lower Cost

While salt is a relatively low-cost material, handling it often involves considerable expense in time and manpower. Unloading bulk salt from boxcars, for example, has always been one of the problem spots. Today, however, a number of money-saving unloading methods have been developed for large and small plants.

Determining which of these modern salt unloading methods is best for your company depends on the tonnage involved, and specific plant requirements. But you can generally find one which will pay for itself—in savings on time and labor—over a relatively short period. Here is a review of four practical salt unloading methods, and the equipment used in each.

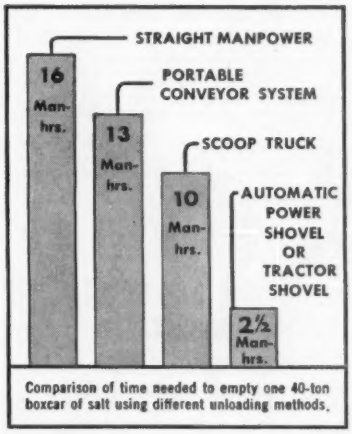
Portable conveyor system. This is the simplest improvement over straight manpower. A power-operated belt conveyor of suitable length is placed inside the car door, and salt is then shoveled onto it. Conveyors may be used to bring salt directly into the plant—or even to storage areas above dock level. A good conveyor for most needs is generally about 16 to 18 feet long and capable of moving salt up a 30° slope. With a conveyor, a good deal of manpower in shoveling is required, but one 40-ton car can be unloaded in about 12 to 14 man-hours—a 19% saving in time over straight manpower.

Scoop truck and conveyor. A scoop truck is simply an enlarged scoop shovel with two small wheels at the bowl of the scoop. Whereas a shovel holds only about 20 lb. of salt—a scoop truck holds 100 to 150 lb. In operation, the scoop is pushed into the salt, tilted up, and then wheeled to the conveyor at the car door. With just one of these scoops, a worker can unload 40 tons of salt in 10 hours—and once the job is under way, there is room for two or three more men with scoops. An important point: A good scoop truck costs only about $50.

Automatic power shoveling. This is one of today's most popular methods for unloading bulk salt—and many manufacturers offer excellent power-shovel equipment. Basically, the device consists of a large power-operated scraper blade mounted on a cable. The scraper is moved toward the end of the car, and as soon as this motion stops, a power winch takes hold to drag the scraper toward the car door. Salt is pushed out through the door by the scraper. One man can unload a 40-ton car in 2 or 3 hours by this unique method. Both winch and motor for the power shovel must be permanently mounted on the dock or side of the building—but the installed cost of this equipment is moderate.

Small gasoline or electric tractor shovel, somewhat similar to a fork-lift truck, but with a scoop mounted in place of the forks. Many types are available, some having forks interchangeable with the scoop. One man on this type of truck can empty a 40-ton car in 2 to 3 hours—the equivalent of power-shovel unloading. The higher cost of a tractor shovel, however, is often justified when it can be made available for other purposes.

Extra savings are possible with tractor shovels with scoop attachments. These trucks not only move salt out of the boxcar, but also transport it to any point of storage or use within the plant. This eliminates the need for various types of conveying equipment—either on the dock or in the plant. And manpower for handling salt in the plant is considerably reduced.



Comparison of time needed to empty one 40-ton boxcar of salt using different unloading methods.

TECHNICAL SERVICE WITH YOUR SALT

Through skilled and experienced "Salt Specialists," International can help you get greater efficiency and economy from the salt you use. International produces both Sterling Evaporated and Sterling Rock Salt in all grades. And we also make automatic dissolvers in metal or plastic for both types of salt. So we have no reason to recommend one type of salt over another; we simply suggest the type and grade of salt most perfectly suited to your needs.

If you'd like help on any problem concerning salt or brine—or further information on salt unloading—contact your nearest International sales office.

International Salt Company, Scranton, Penna.
Sales offices: Atlanta, Chicago, New Orleans, Baltimore, Boston, Detroit, St. Louis, Newark, Buffalo, New York, Cincinnati, Cleveland, Philadelphia, Pittsburgh, Richmond.

FOR INDUSTRY, FARM, AND THE HOME—
STERLING SALT
PRODUCT OF INTERNATIONAL SALT CO., INC.

EMPLOYMENT OPPORTUNITIES

IN THE CHEMICAL PROCESSING INDUSTRIES

- **Displayed Rate**—$19.50 per inch. Contract rates on request. Advertising inch measures 7/8 inch vertically on one column. Subject to Agency Commission. 3 columns to a page.
- **Closing Date**—Each Tuesday, 11 days prior to publication date.

- **Undisplayed Rate**—$1.80 a line, minimum 3 lines. To figure advance payment, count 5 average words as a line. 10% discount if full payment made in advance for 4 consecutive insertions. Position wanted ads ½ above rate.
- **Box Numbers** count as one additional line.

Send NEW ADS & INQUIRIES to Classified Adv. Div. of Chemical Week; P.O. Box 12, N.Y. 36, N.Y.

COMMERCIAL DEVELOPMENT DEPARTMENT PLASTICS

A newly created position with Escambia in its Commercial Development Department requires a man with a broad background of experience in plastics. He will be responsible for the technical and economic evaluations and initial development of markets for new and established monomers and polymers.

Applicants for this position should have a degree in Chemistry or Chemical Engineering and 5 to 10 years marketing or development experience in plastics; must be able to assume a major role in guiding company's ventures in plastics field.

Location in New York City, traveling required. Please send complete resume of background and experience; state salary required. All replies will be held confidential.

ESCAMBIA BAY CHEMICAL CORPORATION

261 Madison Avenue
New York 16, New York

CHEMIST
SPECIALTIES OR WAX EMULSIONS

We require a man experienced in the development of waxes, polishes, or other chemical specialties. Must be able to test against specifications. Age under 40 preferred, but "know how", initiative, and determination to grasp opportunities is the prime requisite.

We suggest you investigate this opportunity afforded by one of the most modern and up to date laboratories of its kind. Congenial environment, company paid for retirement program, and a liberal salary arrangement to the right man, make this a very worthwhile proposition.

Please phone Mr. C. W. McDermott,
Trinity 7-6200

Franklin Research

5134 Lancaster Ave., Phila. 31, Pa.

PROCESS ENGINEER

Fine opportunity for man with heavy chemical process engineering background. Experience in project and production engineering phases, service and equipment specifications. Knowledge of crushing and mill operations desirable. Minneapolis location. Age 30-45. Salary open. Send resume to:

Personnel Director

Archer-Daniels-Midland Co.
700 Investors Bldg.
Minneapolis, Minnesota

WANTED — CHEMISTS, ENGINEERS, MECHANICS

Unusually Interesting Work in Aerosols

The nation's largest aerosol manufacturer needs technical people for plants in New York, Chicago, Los Angeles.

CHEMISTS — Research and Control
ENGINEERS — Creative men who can design equipment
MECHANICS — Capable of maintaining production and machinery

These men should have some related experience, but we will train the right people. Our firm is 20 years old with young aggressive leadership. This is an outstanding opportunity to join the top company in a rapidly expanding industry. Submit complete background résumé.

G. BARR & CO.
3601 S. Racine Avenue
Chicago 9, Illinois

Available

MANUFACTURERS' REPRESENTATIVES SERVING CHEMICAL PROCESS INDUSTRIES

Well established manufacturers' representatives concentrating on sales in the chemical process industries desire an additional line harmonious with existing representation of: specialized fabricated process equipment, crushers, grinders, continuous and batch heat-treating furnaces, packaging equipment.

Territory: New York, New Jersey, Pennsylvania, Delaware, with headquarters in Metropolitan NYC area. Please reply to:

Edward F. James, Pres.
Technical Sales Associates
29 Park Court, Verona, New Jersey

POLYMER CHEMISTS

Will a research-minded company of 1,000 employees satisfy your professional needs? Expanding progressive organization has a number of positions open for polymer chemists with sound theoretical background and interest in a variety of application fields, including adhesives, plastics, elastomers and coatings. Products will be utilized in the textile, rubber and aircraft industries. Individuals will be allowed to pursue research efforts from theoretical level through product development stage.

Dept. SP, Box 369, Erie, Pa.

FOOD CHEMIST

Excellent opportunities—in a financially stable yet growing manufacturing organization—are offered to graduate chemists with extensive research and development experience in the dairy, baking or cereal industries.

Located in metropolitan New York, our progressive company policy provides many employee benefits including life insurance and retirement plan.

Please forward detailed resume of experience, education and salary requirements. All replies confidential. Our employees have been informed of this ad.

Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.
P 2496 Chemical Week

RESIN TECHNICAL SERVICE

Fine opportunity for man with heavy resin technical service, paint formulation or research experience. To assist in field technical sales for resins and paint vehicles. Detroit-Cleveland area. Age 35-45. Salary open. Send resume to:

Personnel Director

Archer-Daniels-Midland Co.
700 Investors Bldg.
Minneapolis, Minnesota

TILING ENGINEER WANTED

Vinyl Asbestos or Vinyl

Excellent opportunity for man having at least two or three years experience. Liberal Pension & Hospitalisation program. Location Midwest.

P 1925 Chemical Week
520 N. Michigan Ave., Chicago 11, Ill.

FLOOR TILE CHEMIST
Wanted

Experienced manufacture vinyl tile. Insurance, Hospitalization, and retirement. Replies treated confidentially.

P 1922 Chemical Week
520 N. Michigan Ave., Chicago 11, Ill.

Positions Wanted

Senior Chemical Engineer in New York Government service at Buffalo, $6890-8370. Applicant must possess professional engineering license in state or territory where he resides and must obtain a New York State license to be eligible for appointment. Two years of experience involving the detection, analysis, elimination and control of dusts, fumes, smokes, liquids and other substances which affect health in industrial plants. Applications close August 24 for September 22, 1956 examination. For details write to Recruitment Office Box 6, New York State Department of Civil Service, Albany, New York.

Development Chemist wanted for work in Industrial Detergents, metal degreasing and chemical specialties. Excellent opportunity for growth with progressive firm. Northern New Jersey area. P-2680 Chemical Week.

Position Wanted

Technical Sales, B.S., Chemistry, 1954. Excellent collegiate background. Limited but valuable experience in sales and personnel supervision. Due for separation from U.S. Army January 1957. PW-2558, Chemical Week.

Selling Opportunities Wanted

New Firm Manufacturers Representatives, extensive experience in petroleum engineering in the Oil and Petro-chemical industry desires manufacturers accounts to these industries for Texas and Louisiana. Efficient representation by qualified sales and field engineers. RA-2623 Chemical Week.

Phila. Pa. Manufacturer's Agent desires additional representations from basic manufacturers of Paper Mill and Metal Plating and Finishing Chemicals. RA-2615 Chemical Week.

TRACERS TO THE CHEMICAL PROCESSING INDUSTRIES

- USED/SURPLUS EQUIPMENT
- CHEMICALS WANTED/OFFERED
- SPECIAL SERVICES
- BUSINESS OPPORTUNITIES

- **Displayed Rate**—$16.50 per inch. Contract rates on request. Advertising inch measures ⅞ inch vertically on one column, 3 columns to a page. Not subject to Agency Commission.
- **Box Numbers** count as one additional line in undisplayed ads.
- **Undisplayed Rate**—$1.80 a line; minimum, 3 lines. To figure advance payment, count 5 average words as a line. 10% discount if full payment is made in advance for 4 consecutive insertions.
- **Closing Date**—Each Tuesday, 11 days prior to publication date.

Send NEW ADS & INQUIRIES to Classified Adv. Div. of Chemical Week; P.O. Box 12, N.Y. 36, N.Y.

SURPLUS WANTED

CHEMICALS, PHARMACEUTICALS, OILS
PLASTICIZERS. RESINS. DYES
SOLVENTS, PIGMENTS. ETC.

CHEMICAL SERVICE CORPORATION
96-02 Beaver Street, New York 5, N. Y.
HAnover 2-6970

BUYERS OF SURPLUS

CHEMICALS—OILS—SOLVENTS

DRUGS—RESINS—WAXES
PLASTICS—COLOR—ETC.

BARCLAY CHEMICAL COMPANY, INC.
75 Varick Street New York 13, N. Y.
WORTH 4-5120

SURPLUS CHEMICALS WANTED

Chemicals—By-Products—Plasticizers

Pigments — Resins — Solvents

CHEMSOL, INC.
70 Dod Street, Elizabeth, N.J. EL 4-7654

SURPLUS BOUGHT

ODD LOTS—DISCONTINUED RAW MATERIALS
—SPENT OR CONTAMINATED SOLVENTS
RESIDUES — METAL SLUDGES —
OBSOLETE PLANT INVENTORIES

Industrial By-Products Surplus Co.
DIV. OF ACETO CHEMICAL CO., INC.
40-40C Lawrence St., Flushing 54, N. Y.
INdependence 1-4100

WILL BUY

Medium to small chemical manufacturing plant. Wilmington, Delaware area preferred. State products produced, value of plant and full particulars. Information held strictly confidential. BO 2688 Chemical Week.
Class. Adv. Div. P.O. Box 12, N.Y. 36, N.Y.

WANTED

(1) 500, 750 or 1000 gal. Stainless Steel Clad Autoclave capable handling 1500, 2000 or 3000 lb. pressures.
(2) Rotary Vacuum Filter String Discharge complete with accessories; size 70/100 Sq. Ft.

W 2663 CHEMICAL WEEK
Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

For Sale

Unused Patterson Foundry 5' dia. x 22' long Ball Tube Mill, Manganese Steel liner, 200 HP motor. Perry Eqpt. Corp., 1415 N. 6th St., Phila. 22, Pa.

Bird Stainless Steel Suspended Centrifugal, 48" dia. perforated basket, 20 HP-5 HP motor, 600-300 RPM. Can be seen running. Perry, 1415 N. 6th St., Phila. 22, Pa.

Bird 24" x 24" Horizontal Continuous Screen Filter, monel contact parts. Perry, 1415 N. 6th St., Phila. 22, Pa.

Surplus Fertilizer Mixing and Handling equipment for sale complete list of machinery available at Berkeley and Los Angeles plants will be sent on request to: Pacific Guano Company 1832 Second Street, Berkeley 10, California. Telephone THornwall 5-7120 TWX: OA 430.

Steel Tanks—Immediate Delivery—10-7,316 gal. & 20-7,100 gal. ea. welded steel tanks, one-piece, dished and flanged heads, will withstand pressure, have been removed from food processing plants in Western New York, now stored in railroad yard for immediate inspection & shipment, priced as low as 5¢ per gal. depending upon quantity ordered, inspection invited, write for complete listings, dimensions & other tanks available. FS-2653 Chemical Week.

Water Filters—Used Niagara diatomaceous earth filters, capacity 300-400 gpm ea. with 15 Niagara leaves & total area of 330 sq. ft. in each of 2 filters; this capacity can be increased by one-third, with quick opening patented cover, pumps & accessories, available immediate delivery, prices less than half of new, inspection invited. FS-2656 Chemical Week.

Elliot Steam Generator—200 KW steam turbine generator, can be used either for AC or DC, cost approx. $20,000., available Memphis, Tenn., price 25¢ on the dollar. FS-2660 Chemical Week.

Business Opportunity

Cincinnati, Ohio, storage space up to 5 m. sq. ft. available with or without services, 27-year-old company, experienced chemical men, can store, ship or sell. BO-2222, Chemical Week.

Plant for Rent

Paterson, N.J. One story brick, 26,000 ft. sprinklered high pressure steam, RR siding, underground storage tanks, fenced yard, unrestricted. PFR-2174, Chemical Week.

Contract Work

Small modern chemical mfg. plant, near N.Y.C.— up to 200 gal. cap. Glass & S.S. equipment. Crystallizing specialist, 20 yrs. experience pharmaceuticals, dye intermediates, etc. Let us quote on your requirements. CW-2698 Chemical Week.

THIS TRACER SECTION

can be used whenever you are looking for or offering

EQUIPMENT

SUPPLIES

OPPORTUNITIES

PLANTS

CHEMICALS

The rates are low—Just call or write

tracers

CHEMICAL WEEK

P.O. Box 12 LOngacre

NY 36 NY 4-3000

MANAGEMENT SERVICES

- General Consulting
- Management
- Patents
- Systems Engineering
- Instrumentation
- Equipment Design
- Catalyst Development
- Translation

Chemical & Bacteriological Analysis

FOOD RESEARCH LABORATORIES, INC.

Founded 1922

Research • Analyses • Consultation
Chemical, Nutritional, Toxicological Studies
for the Food, Drug and Allied Industries

48-14 33rd Street
Long Island City 1, N.Y.

D. H. KILLEFFER

- TECHNICAL PUBLICITY
- TECHNICAL SALES LITERATURE
- ANNUAL REPORTS
- COMPANY HISTORIES
- BIOGRAPHIES
- TECHNICAL GHOST WRITING

Telephone: SPencer 9-8821
168 Westchester Avenue Tuckahoe 7, N. Y.

MACCO CORPORATION

Refinery and Chemical Division
Engineering, Design, Drafting,
Construction, Process Engineering
for
Petroleum Refineries, Chemical
and Petro-Chemical Plants

14409 So. Paramount Blvd., Paramount,
(Los Angeles) Calif. Phone: NEvada 6-1261

THE C. W. NOFSINGER CO.

"In Engineering, it's
the PEOPLE that Count"
Engineers and Contractors for the Petroleum and Chemical Industries

906 Grand Ave. • Kansas City 6, Missouri
Phone BAltimore 1-4146

JAMES P. O'DONNELL

Engineers

Professional Engineering for the
Petroleum and Process Industries

39 Broadway Bowie Bldg.
New York City Beaumont, Texas

SIRRINE

ENGINEERS

Plant design & Surveys covering Chemical Electrochemical and Metallurgical Production; Industrial Waste Disposal; Water Supply & Treatment; Analysis & Reports

J. E. SIRRINE CO.
Greenville South Carolina

TECHNICAL ENTERPRISES, Inc.

Engineers—Consultants—Chemists
to
Chemical—Food—Pharmaceutical Industries
Complete Engineering Services
Process and Product Research & Development
SPECIALISTS IN
SMALLER MANUFACTURING PLANTS
31 South St., New York 4, N. Y. WH 3-1544

Professional Assistance

in solving your most difficult problems is offered by consultants whose cards appear in this section.

increased since 1949, costs for new freight cars are up 72%.

Shippers, however, see the change as a permanent charge to be levied on them by railroads with no provision for a cut-off date after the present shortage of freight cars eases. The proposed change differs from car service orders put out by railroads when temporary rate increases are needed: these carry a termination date.

Originally the new demurrage increases were scheduled to go into effect Aug. 1, but were later postponed until Sept. 1 to give shippers more time to protest them. It remains now for ICC to analyze protests that are sure to come from the National Industrial Traffic League and other shipper groups, then to either okay the hike or suspend it for several months pending further investigations.

DATA DIGEST

• **Propionaldehyde:** 13-p. bulletin furnishes information on specifications, chemical reactions, physical properties, and applications in polyesters, pharmaceuticals, plastics, resins, rubber chemicals, ion exchange, zinc purification, perfumes and photography. Carbide and Carbon Chemicals Co. (New York).

CHEMICAL WEEK • ADVERTISERS INDEX

August 18, 1956

AMERICAN CYANAMID CO. MANUFACTURERS CHEMICALS DEPT. 37
Agency—Hazard Adv. Co.
AMERICAN POTASH & CHEMICAL CORP. 47
Agency—McCarty Co.
ANSUL CHEMICAL CO., THE 8
Agency—Kenyon & Eckhardt, Inc.
ARCHER, DANIELS, MIDLAND CO. 60
Agency—The Bayless-Kerr Co.
ATLANTIC REFINING CO. 85
Agency—N. W. Ayer & Son, Inc.
BAKER PERKINS, INC. 91
Agency—Price, Tanner & Willox, Inc.
BALTIMORE & OHIO RAILROAD 56
Agency—Richard A. Foley Adv.
BARNEBEY-CHENEY CO. 82
Agency—Byer & Bowman Adv.
BARRETT DIV., ALLIED CHEMICAL & DYE CORP. 23
Agency—McCann-Erickson, Inc.
BEACON CHEMICAL INDUSTRIES, INC. 82
Agency—Mina Lee Simon Adv.
BERKSHIRE CHEMICALS, INC. 94
Agency—Givaudan, Adv., Inc.
BLAW-KNOX CO. 20
Agency—Ketchum, MacLeod & Grove, Inc.
BORDEN CO., THE CHEMICAL DIV. 15
Agency—Fuller & Smith & Ross, Inc.
CARBIDE & CARBON CHEMICALS CO., DIV. OF UNION CARBIDE & CARBON CORP. 43
Agency—J. M. Mathes, Inc.
CELANESE CORP. OF AMERICA 38
Agency—Ellington & Co., Inc.
CLARK EQUIPMENT CO. 24
Agency—Marsteller, Rickard, Gebhardt & Reed, Inc.
COMMERCIAL SOLVENTS CORP. 67
Agency—Fuller & Smith & Ross, Inc.
CONSOLIDATED CHEMICAL INDUSTRIES INC. 88
Agency—Brennan Adv. Agency
CONSUMERS POWER CO. 68
Agency—Commonwealth Service, Inc.
CROSSETT CHEMICAL CO. 84
Agency—Dan Goodrich Adv.
DAY CO., INC., THE J. H. 64
Agency—Strauchen & McKim Adv.
DELTA TANK MFG. CO., INC. 9
Agency—Sewell Advertising Agency
DICALITE DIV., GREAT LAKES CARBON CORP. 78
Agency—Darwin H. Clark Co.
DISTILLATION PRODUCTS INDUSTRIES DIV. OF EASTMAN KODAK CO. 62
Agency—Charles L. Rumrill & Co.
DOW CHEMICAL CO., THE 73
Agency—MacManus, John & Adams, Inc.
DU PONT DE NEMOURS & CO., INC. POLYCHEMICALS DEPT. 57
Agency—Batten, Barton, Durstine & Osborn, Inc.
EASTMAN CHEMICAL PRODUCTS, INC. 51
Agency—Fred Wittner, Adv.
EL DORADO DIV., FOREMOST FOOD & CHEMICAL CO. 21
Agency—Sidney Garfield & Assoc.
EMERY INDUSTRIES, INC. 101
Agency—Ruthruff & Ryan, Inc.
ENJAY CO., INC. 11
Agency—McCann-Erickson, Inc.
FANSTEEL METALLURGICAL CORP. 66
Agency—Symonds, MacKenzie & Co., Inc.
FIRESTONE PLASTICS CO. 87
Agency—Gray Adv. Agency, Inc.
FOSTER WHEELER CORP. 13
Agency—Marsteller, Rickard, Gebhardt & Reed, Inc.
FULLER CO., THE 14
Agency—O. S. Tyson & Co.
GENERAL AMERICAN TRANSPORTATION CORP., LOUISVILLE DRYER DIV. 2
Agency—Weiss & Geller, Inc.
GENERAL CHEMICAL DIV., ALLIED CHEMICAL & DYE CORP. 4th Cover
Agency—Atherton & Currier, Inc.
GENERAL TIRE & RUBBER CO., CHEMICAL DIV. 26
Agency—D'Arcy Adv., Co.
GIRDLER CO., THE 25
Agency—The Griswold-Eshleman Co.
GOODYEAR TIRE & RUBBER CO., INC. 1
Agency—Kudner Agency, Inc.
GOODRICH CHEMICAL CO., B. F. 12, 71
Agency—Griswold-Eshleman Co.
GRINNELL CO., INC. 34
Agency—Horton-Noyes Co., Adv.
HARSHAW CHEMICAL CO. 75
HAVEG INDUSTRIES, INC. 22
Agency—The Roland G. E. Ullman Organization, Inc.
HERCULES POWDER CO. 28, 77
Agency—Fuller & Smith & Ross, Inc.
HOOKER ELECTRO-CHEMICAL CO. 19
Agency—Charles L. Rumrill & Co.
INLAND STEEL CONTAINER CO. 6
Agency—Weiss & Geller, Inc.
INTERNATIONAL MINERALS & CHEMICAL CORP. 79
Agency—C. Franklin Brown, Inc.
INTERNATIONAL PAPER CO. 3rd Cover
Agency—Picard, Marvin & Redfield Adv.
INTERNATIONAL SALT CO. 103
Agency—Batten, Barton, Durstine & Osborn Inc.
KNOX PORCELAIN CORP. 84
KRAFT BAG CORP. 95
Agency—Arthur A. Judson, Inc.
LOCKWOOD GREENE ENGINEERS, INC. 100
Agency—The House of J. Hayden Twiss
MALLINCKRODT CHEMICAL WORKS 52, 53
Agency—Smith & Williams Adv., Inc.
MARATHON CORP. 53
Agency—Cormack-Imse-Beaumont Adv.
McKESSON & ROBBINS, INC. 86
Agency—Ellington & Co., Inc.
McLAUGHLIN GORMLEY KING CO. 96
Agency—The Alfred Colle Co.
METAL HYDRIDES, INC. 96
Agency—Creamer-Trowbridge Co.
MICHIGAN CHEMICAL CORP. 85
Agency—Wesley Aves & Assoc., Inc.
MONSANTO CHEMICAL CO. 7
Agency—Gardner Adv. Co.
MORTON SALT CO. 27
Agency—Needham, Louis & Brorby, Inc.
OLDBURY ELECTRO-CHEMICAL CO. 102
Agency—Briggs & Varley, Inc.
OLIN MATHIESON CHEMICAL CORP. 4-5
Agency—Doyle, Kitchen & McCormack, Inc.
PHILADELPHIA QUARTZ CO. 86
Agency—The Michener Co., Adv.
PITTSBURGH COKE & CHEMICAL CO. 45
Agency—W. S. Walker Adv., Inc.
PITTSBURGH PLATE GLASS CO. 102
Agency—Mason Inc. Adv.
PROCON, INC. 97
Agency—Sam J. Gallay Adv.
ROHM & HAAS CO. 46
Agency—Arndt, Preston, Chapin, Lamb & Keen, Inc.
SHARPLES CHEMICALS, INC. 83
Agency—Sommer-Davis, Inc.
SHAWINIGAN RESINS CORP. 55
Agency—Wilson, Haight, Welsh & Grover, Inc.
SHELL CHEMICAL CORP. 16
Agency—J. Walter Thompson Co.
FOSTER D. SNELL, INC. 3
Agency—Ray Hawley Adv.
SPENCER CHEMICAL CO. 93
Agency—Bruce B. Brewer
SPERRY & CO., D. R. 94
Agency—Illinois, Simmonds & Simmonds, Inc.
STALEY MFG. CO., A. E. 50
Agency—Ruthrauff & Ryan, Inc.
STRAN-STEEL CORP., A UNIT OF NATIONAL STEEL CORP. 10
Agency—Campbell-Ewald Co.
TENNESSEE CORPORATION 44, 99
Agency—Crawford & Porter, Inc.
UNITED BOX & LUMBER CO. 100
Agency—Ira S. Kahn Co., Adv.
UNITED STATES POTASH CO., INC. 96
Agency—McCann-Erickson, Inc.
VANADIUM CORP. OF AMERICA 76
Agency—Hazard Adv. Co.
WESTVACO CHLOR-ALKALI DIV. FOOD MACHINERY & CHEMICAL CORP. 2nd Cover
Agency—James J. McMahon, Inc.
WOLF & CO., JACQUES 74
Agency—Riedl & Freede, Inc.
WYANDOTTE CHEMICAL CORP. 61
Agency—Brooke, Smith, French & Dorrance, Inc.

tracers SECTION
(Classified Advertising)
F. J. Eberle, Business Mgr.

CHEMICALS: Offered/Wanted 105
EMPLOYMENT 104
EQUIPMENT: Used/Surplus New For Sale 105
WANTED 105
MANAGEMENT SERVICES 105
SPECIAL SERVICES 105

ADVERTISING STAFF

Atlanta 3 ..... Robert H. Powell
Rhodes-Haverty Bldg., Walnut 5778-2383

Boston 16 ..... 350 Park Square Building
Hubbard 2-7160

Chicago 11 ..... Alfred D. Becker, Jr., Francis E. Stewart, 520 N. Michigan Ave., Mohawk 4-5800

Cleveland 15 ..... Vaughn K. Dissette, 1510 Hanna Bldg., Superior 1-7000

Dallas 2 ..... Gordon L. Jones, Adolphus Tower Bldg., Main & Ackard Sts., Prospect 7-5064

Detroit 26 ..... 856 Penobscot Bldg., Woodward 2-1793

London .... H. Lagler, McGraw-Hill House, 95 Farrington St., E.C. 4, England

Los Angeles 17 ..... Peter Carberry, 1125 West Sixth St., Madison 6-9351

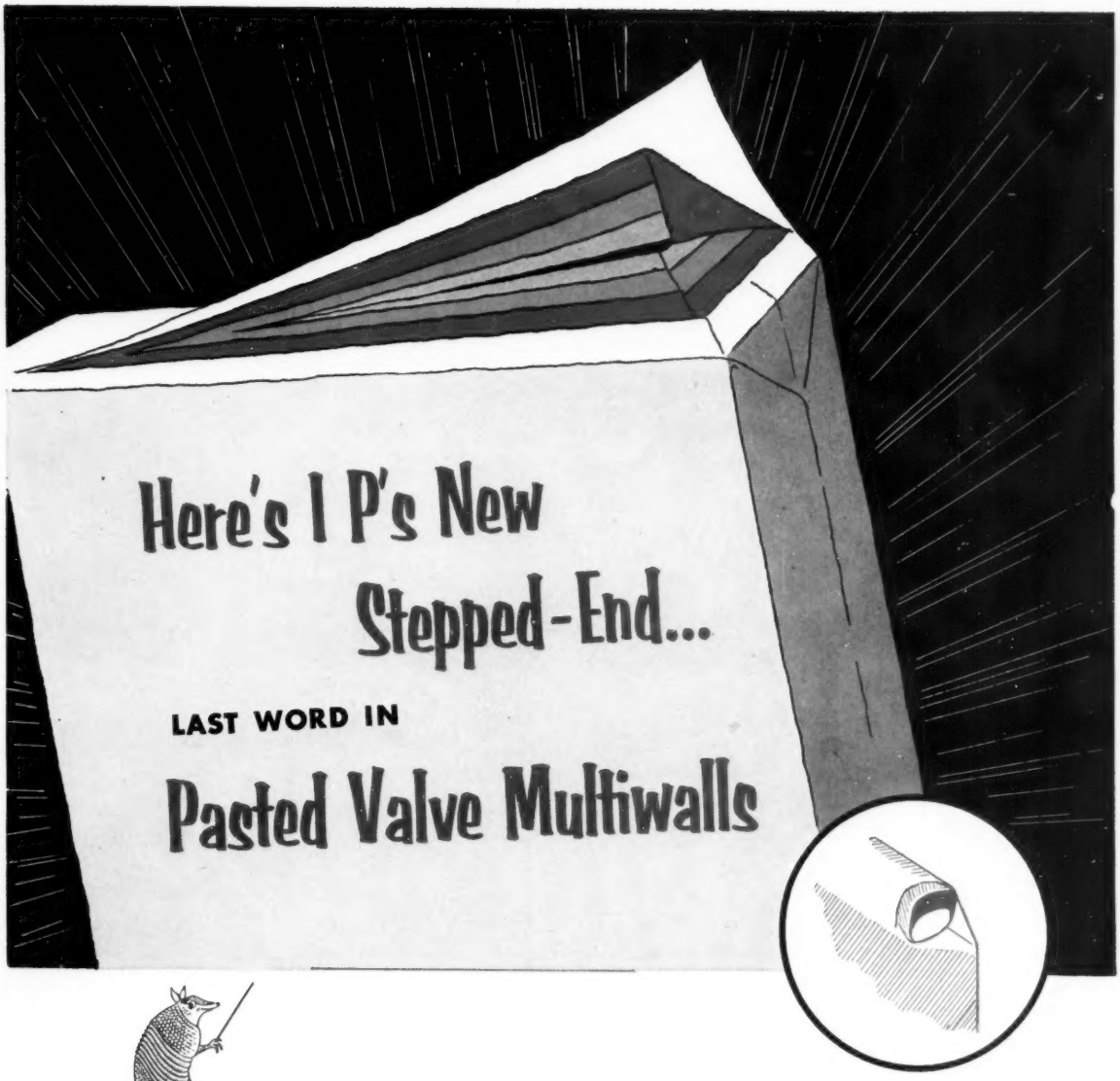
New York 36 ..... Knox Armstrong, P. F. McPherson, Charles F. Onasch, L. Charles Todaro, 330 West 42 St. LOngacre 4-3000

Philadelphia 3 .. William B. Hannum, Jr. Architects Bldg., 17th & Sansom Sts., RIttenhouse 6-0670

Pittsburgh 22 ..... 919 Oliver Bldg. Atlantic 1-4707

San Francisco 4 ..... William C. Woolston, 68 Post St., Douglas 2-4600

St. Louis 8 ..... 3615 Olive St., Continental Bldg., Jefferson 5-4867



Real Flexibility—Each ply is full-pasted to itself—but not to the other plies.

Armored Strength—The accurate overlapping of paper tube ends together with the built-in flexibility gives chain-mail strength to both ends of the bag.

New Full Wrap-around Valve Sleeve—This complete sleeve, combined with armored strength and real flexibility, means stronger, more sift-proof and cleaner bags.

All this adds up to wide service and greater values to all users of Bagpak multiwall bags.

For more information, prices and delivery dates, call nearest branch, or call direct.

produced on new equipment—the latest, most accurate, and finest machinery made.

International Paper COMPANY

BAGPAK DIVISION

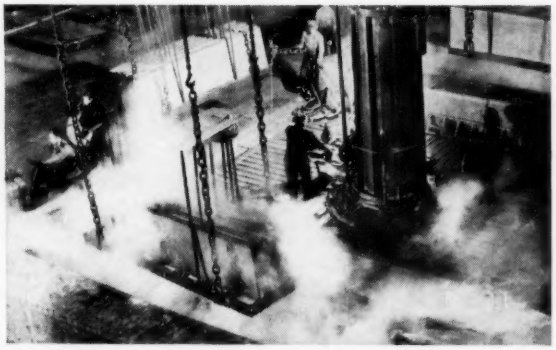
CW-8

220 EAST 42ND STREET, NEW YORK 17, N. Y.

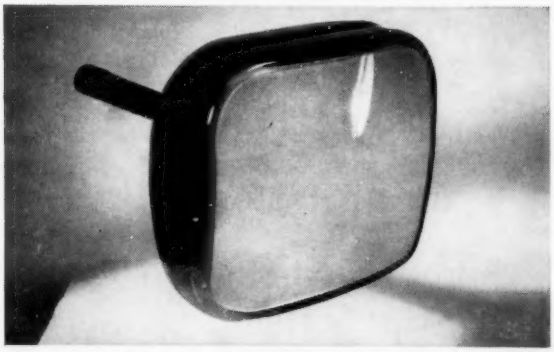
BRANCH OFFICES: Atlanta · Baltimore · Boston · Chicago · Cincinnati · Cleveland · Dallas · Denver · Des Moines · Detroit · Kansas City, Kansas · Los Angeles Minneapolis · New Orleans · Philadelphia · St. Louis · San Francisco · IN CANADA: The Continental Paper Products, Ltd., Montreal, Ottawa, Toronto

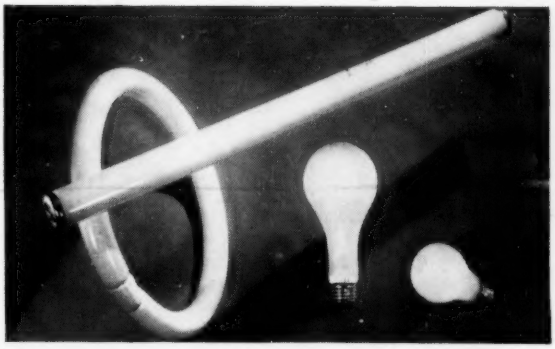
ANHYDROUS Hydrofluoric Acid for alkylation catalyst; also catalyst and fluorinating agent in many other organic and inorganic reactions.

AQUEOUS Hydrofluoric Acid for steel pickling, glass frosting and etching; also for electropolishing of metals, ore flotation, manufacture of other chemicals.



For "HF" Call GENERAL





YOUR CONVENIENT SOURCE OF SUPPLY: In the East, Midwest and California, 7 General Chemical supply points place stocks within convenient shipping distances.

Producing Works:

Marcus Hook, Pa.
(near Philadelphia)
Baton Rouge, La.

Packaging Locations:

Buffalo, N. Y.
Chicago, Ill.
Cleveland, Ohio
El Segundo, Calif.
(Los Angeles)
Pittsburgh, Pa.

GC
Allied Chemical

As a major producer of Hydrofluoric Acid since the turn of the century, General Chemical has extensive experience in the manufacture and industrial applications of Hydrofluoric Acid, both aqueous and anhydrous, and its many fluorine chemical derivatives.

For your requirements—or for product information or helpful technical service—just phone or write the nearest General Chemical office listed below.

First in fluorides

GENERAL CHEMICAL DIVISION

ALLIED CHEMICAL & DYE CORPORATION

40 Rector Street, New York 6, N. Y.

Offices: Albany • Atlanta • Baltimore • Birmingham • Boston • Bridgeport • Buffalo • Charlotte • Chicago • Cleveland Denver • Detroit • Greenville (Miss.) • Houston • Jacksonville • Kalamazoo • Los Angeles • Milwaukee • Minneapolis New York • Philadelphia • Pittsburgh • Providence • San Francisco • Seattle • St. Louis • Yakima (Wash.)

In Canada: The Nichols Chemical Company, Limited • Montreal • Toronto • Vancouver